Service Handbook

HP VISUALIZE J6700 Workstations

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Edition E0501

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1 Product Information

This chapter provides general product information about the HP VISUALIZE J6700 workstation. This information is provided to help familiarize you with the main features and components of the workstation.

Chapter Overview

This chapter contains the following main sections:

- Product Description
- Front Panel Components
- Rear Panel Components
- Internal Components
- Monitors
- Keyboard and Mouse

Product Description

The HP VISUALIZE J6700 workstation is a high-performance system capable of handling the most complex problems in computational analysis, advanced 3-D design, and electronic circuit design and verification.

The J6700 has two PA-8700 microprocessors and sixteen memory slots on its system board. It has a 715 Watt power supply with no DC/DC converter units required.

Net Dimensions and Weights

The dimensions for the deskside system are listed below.

- Depth: 25.8 inches (65.5 cm)
- Width: 10.0 inches (25.4 cm)
- Height: 19.8 inches (53.3 cm)

The dimensions for the rack system are listed below.

- Depth: 24.5 inches (62.2 cm)
- Width: 16.7 inches (42.4 cm)
- Height: 3.4 inches (8.6 cm)

. Table 1-1 lists the net weights for the J6700.

Table 1-1. Net Weights for the J6700 Workstations

	Weight
Deskside Configuration	Min. - 40lbs. (17 kg.) Max. - 49 lbs (22 kg.)
Maximum Configuration (Rack Mount)[1]	Min. - 36lbs. (16 kg.) Max. - 41 ls. (18 kg.)
Maximum Configuration (Twenty Fully Equipped Workstations and the Rack)	1200 pounds (544 kg)

1. The rails weigh approximately 10 lbs. (4 kg.). This weight is not included in these figures.

NOTE For environmental and electrical requirements, see Appendix B.

Key Features

The J6700 workstations have the following key features.

- **CPUs:**
  - — Two 750MHz PA-8700 microprocessors, each with 0.75 MB instruction cache and 1.5 MB data cache.
- **Operating System** (Native HP-UX)**:**
  - — 64-bit support requires HP-UX version 11.0 plus ACE 1199 and HP-UX version 11i plus ACE 0601.
- **User Interface:** HP CDE (Common Desktop Environment) graphical user interface
- **Compatibility**: Source- and binary-code compatible with the B-, C-, and J-Class product families
- **Main Memory:** Using 512MB or 1 GB DIMMs
  - — Sixteen DIMM slots in pairs (from 1GB up to 16GB total)
- **Power Supply:**
  - — 500 Watt (output power), 715 Watt (input power) with two VRM modules
- **Remote Power-On**
  - — Remote power-on feature that allows you to power up and shut down your workstation remotely through the RS232 port.
- **Internal Storage Devices:**
  - — Up to two Low-Voltage Differential (LVD) SCSI hard drives.
  - — One optional ATAPI Slim-line CD drive.
- **Standard Networking:** Ethernet IEEE 802.3 RJ45, Twisted Pair 10/100 Base T
- **Standard I/O:** Two GB/sec aggregate I/O bandwidth
  - — One Low-Voltage Differential (LVD)/Single-ended (SE) SCSI connector (multi-mode)
  - — Two USB (Universal Serial Bus) connectors (keyboard and mouse)
  - — Two serial interface connectors (RS-232C)
  - — Audio connectors (line input, line output, headphone, and microphone)

- **I/O Expansion Capabilities:** 64-bit PCI (Peripheral Connect Interface) slots
  - — Three PCI-4X slots at 3.3V, 66MHz
- **Optional Graphics Cards Currently Supported:**
  - — HP VISUALIZE-*fx*^{10}
  - — HP VISUALIZE-*fxe*
- **Monitors Currently Supported:**
  - — PC compatible monitors that support a minimum resolution of 1024×768 and a frequency of 75Hz
- **Standard Keyboard:** The USB connector provides an interface for the keyboard to the system. This keyboard provides the standard keys found on most PC keyboards.
- **Mouse:** The HP mouse (USB) has left, middle, and right buttons that function the same as most mice. For general information on the various cursor shapes associated with different areas of HP CDE while using a mouse, see the *Using Your HP Workstation* document.

Front Panel Components

Before powering on your system, you should become familiar with the system unit controls.

Figure 1-1 shows the front panel components with the bezel attached.

Figure 1-1. System Unit Front Panel Controls With Bezel

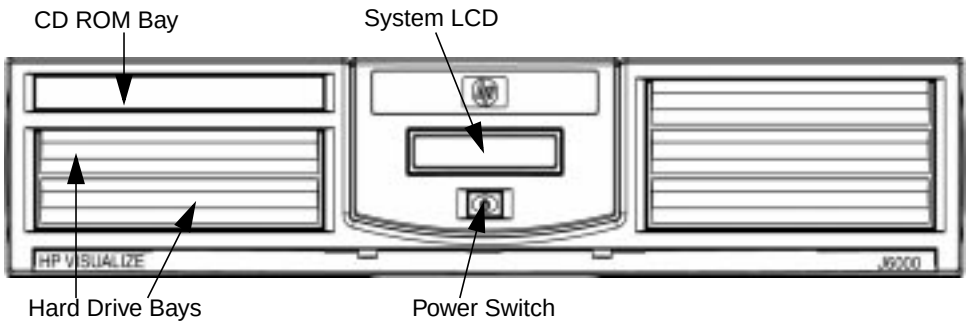
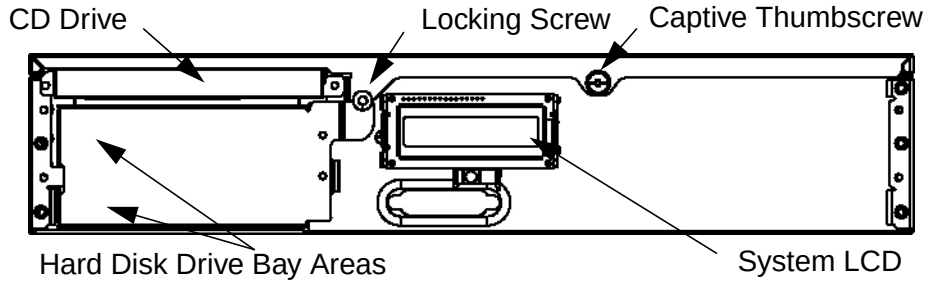


Figure 1-2. System Unit Front Panel Controls With Bezel Removed



CAUTION This workstation is designated for two-person lifting. It weighs approximately 36 to 49 pounds (16 to 22 kg), depending on the configuration. Do not attempt to lift it by yourself, or injury may result.

Power Switch

This switch turns the system on and off. When you turn your workstation off, the operating system automatically executes the `shutdown -q` command. This prevents any damage to programs and data on your system disk. Turning the power switch back on again automatically boots up the HP-UX operating system if your system has been configured to auto boot.

Thumbscrew on the Front Panel

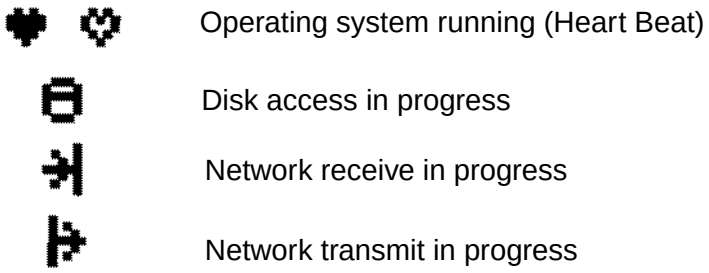
There is one captive thumbscrew near the center of the front panel. Loosening and pulling toward you with this screw allows the top panel to be removed. The top panel must be in place or the system will not power up.

Between the LCD panel and the CD ROM drive, there is a threaded hole for an optional locking screw. The locking screw is included in the bag of miscellaneous parts which comes with the workstation. This locking screw allows the user to protect his/her workstation form unwanted entry.

System LCD

The Liquid Crystal Display (LCD) indicator is located on the front panel. The LCD has two 16 characters lines. The LCD displays messages about the state of the system, including chassis codes. The symbols in Figure 1-3 appear in the LCD if you have the HP-UX 11.0 or 11i operating system booted on your system. They represent the different system activities.

Figure 1-3. LCD Symbols



Internal Storage Devices

The J6700 workstations support the following internal storage devices, which are also located on the front panel, under the bezel:

- Up to two hot-pluggable, Low-Voltage Differential (LVD) hard disk drives
- One ATAPI (IDE) Slim-Line CD drive (optional)

The following subsections describe these internal storage devices.

Hard Disk Drive(s)

The J6700 workstations can support up to two hot-pluggable, Low-Voltage Differential (LVD) hard disk drives. These hard disk drives are 3.5-inch form factor, 10K RPM devices which connect to Ultra2 Wide LVD (Low Voltage Differential) SCSI interfaces on the disk bay backplane. The hard disk drive bays are located on the lower left side of the front panel, below the CD ROM drive. See Figure 1-1.

The two hard disk drive models currently supported are:

- 18 GB LVD 10K RPM disk drive (Product Number A4998A)
- 36 GB LVD 10K RPM disk drive (Product Number A6013A)

NOTE The ability to hot plug the hard disk drive(s) requires MirrorDisk/UX (Product Number B2491BA on HP-UX 11.0 ACE 1199 or HP-UX 11i ACE 0601).

The Hot-Plug Process

The physical aspect of inserting and removing a disk drive is discussed in the document that comes with the drive. However, the operating system must be prepared for the insertion or removal of a disk, or unexpected and harmful effects may occur.

There is a significant difference between the terms “hot-pluggable” and “hot-swappable”. Hot swapping happens at the device level; that is, a hot-swappable device manages insertion/removal on its own without assistance from HP-UX commands. *The disk drive(s) in the J6700 are not hot-swappable; they are merely hot-pluggable*. Thus, a manual software procedure must be done in order to safely remove or insert disk drives while the system is running.

The hot-plug process allows you to replace a defective disk drive in a high-available system while it is running.

Replacing a Failed Disk Drive

In the context of replacing a failed disk drive, the system administrator must determine which disk has failed. Depending on how the system was set up, the identity of the failed drive may or may not be obvious. This determination may be done in either of two ways:

- Tracking the error message written by the LVM (Logical Volume Manager) to the system console and/or a log file. For information on LVM commands, see the man pages for `vgchange`, `lvreduce`, `vgfgrestore`, `lvlnboot`, `lvextend`, `lvsync`, etc.
- If installed, run the diagnostic utility Support Tool Manager (xstm) to determine disk malfunction.

The removal of a defective disk drive from an active file system is supported through LVM commands if hot-pluggable disks have been configured into the HP-UX file system with LVM. To provide high availability, without impact to users, the disks must also be configured as mirrored disks. Disk-mirroring is accomplished through use of the MirrorDisk/UX software (HP part number B2491BA); for information on classes, see `http://www.hgp.com/education/courses/h628s.html`.

No graphical user interface is currently offered through the System Administrator Manager (SAM) for doing the required LVM commands because manipulation of the LVM requires specialized knowledge that only experienced system administrators are expected to have (see below for details).

Hot-Plug Example

The following example describes a particular system problem where the solution is to replace a hot-plug disk module.

Volume group `/dev/vg00` contains the two disks, with the logical volume configuration as shown:

Table 1-2. Example Configuration

Volume Description	Volume Description
Logical Volume 1	Logical Volume 3
Logical Volume 2	Logical Volume 4
Logical Volume 3	Logical Volume 5

```
hardware address      10/0/12/0.0   10/0/13/0.0
device file(/dev/dsk/)   c2t6d0          c2t5d0
```

The system problem for this example is that the disk at hardware address 10/0/13/0.0 has a head crash, and as a result, is unusable. The steps described in the Hot-Plug Procedure section below outline a method that can be used to recover from this state.

1. All of the replaced disk's in-use extents must belong to mirrored logical volumes which were created with the "strict" option (`-s`); see the documentation for MirrorDisk/UX.
2. You must have an up-to-date configuration backup file. This is done automatically each time an LVM command changes LVM configuration.

   The default backup file's path is:

   `/etc/lvmconf/<base_vg_name>.conf`

   For example,

   `/etc/lvmconf/vg00.conf`
3. The replacement disk must be the same product ID as the replaced one.

NOTE HP often uses different manufacturers for disks having the same product number. The hot-plug manual procedure will not update the disk driver's internal information to that of the replaced disk.

The replacement disk will have the same capacity and block size as the defective disk because they have the same product number. The only field that could be incorrect is the string specifying the vendor's name. This will not affect the behavior of the LVM. If it is desired to update the manufacturer's name, the disk's volume group must be deactivated and reactivated. See the *HP-UX System Administration Tasks* manual for details.

The Hot-Plug Procedure

These are the steps required to properly hot-plug a disk drive:

Step 1

- Check if the LVM found the physical volume to be defective when the volume group was activated.
- The "vgchange -a y" command would have printed the following message on the console:

```
WARNING:
VGCHANGE:WARNING: COULDN'T ATTACH TP THE VOLUME GROUP
PHYSICAL VOLUME "/DEV/DSK/cXtXdX"

THE PATH OF THE PHYSICAL VOLUME REFERS TO A DEVICE THAT DOES NOT
EXIST, OR IS NOT CONFIGURED INTO THE KERNEL.
```

- If the status of the "vgchange -v vg02" is unknown, you may check if this occurred by doing a vgdisplay command:
  vgdisplay<*VG name*>
  For our example:
  vgdisplay /dev/vg00
- If the disk was defective at vgchange time, the following messages will be printed one or more times:

```
WARNING:
VGDISPLAY: WARNING: COULDN'T QUERY PHYSICAL VOLUME
     "/DEV/DSK/cXtXdX"
THE SPECIFIED PATH DOES NOT CORRESPOND TO PHYSICAL VOLUME
ATTACHED TO THE VOLUME GROUP.

VGDISPLAY: WARNING: COULDN'T QUERY ALL OF THE PHYSICAL
VOLUMES
```

- If you see these messages, the disk was defective at the time the volume group was activated.

Otherwise, your disk became defective after the vgchange and you must continue with step 2 of this procedure.

Step 2

- Reduce any logical volumes that have mirror copies on the faulty disk so that they no longer mirror onto that disk (note the `-A n` option). This will take a several minutes.

  `lvreduce -m 0 -A n <LV name> /dev/dsk/<hard drive>`
  (*for 1-way mirroring*)

  For example:

  ```
  lvreduce -m 0 -A n /dev/vg00/stand /dev/dsk/c2t5d0
  lvreduce -m 0 -A n /dev/vg00/swap /dev/dsk/c2t5d0
  lvreduce -m 0 -A n /dev/vg00/ /dev/dsk/c2t5d0
  ```

  The number of logical volumes that this step needs is variable. For instance, on a mirror of a `root disk you should have at least three logical volumes: /stand (is lvol1), /swap` (is `lvol2`), and `/` (is `lvol3`). Note that if your `root` mirror disk dies, you need to do the following:

  — Follow the procedure in the section "Initial System Loader (ISL) Environment" in the chapter "Boot Console Handler" in this document. At the **Main Menu** prompt boot from the good disk.

  — Type `y` at the `Interact with ISL` prompt and press **Enter**.

  — Type this command at the ISL prompt and press **Enter**: `hpux -lq`

  The `-lq` option stands for loss of quorum. Once this procedure has been completed the system will boot.

Step 3

- Replace the faulty disk.
- Do an `ioscan` on the replaced disk to insure that it is accessible and also as a double check that it is a proper replacement.

  For example:
  ```
  ioscan /dev/dsk/c2t5d0
  ```

Step 4

- Restore the LVM configuration/headers onto the replaced disk from your backup of the LVM configuration:
  `vgcfgrestore -n <volume group name> /dev/rdsk/cxtxdx`

  where *x* is the logical unit number of the disk that has been replaced.

  For example:
  ```
  vgcfgrestore -n /dev/vg00   /dev/rdsk/c2t5d0
  ```

Step 5

- Attach the new disk to the active volume group with the vgchange command.
  ```
  vgchange -a y /dev/vg00
  ```

Step 6

- If the disk is not a mirror of a root disk, then skip this step.
- Run the mkboot command. For example:
  ```
  mkboot /dev/rdsk/c2t5d0
  ```
- Run `lvlnboot -R` to relink the replaced disk into the Boot Data Reserved Area of all the Physical volumes in the Volume group.
  ```
  lvlnboot -R
  ```

Step 7

- Run the `lvsync` command to synchronize the physical extents of each logical volume specified by logical volume path. Synchronization occurs only on physical extents that are stale mirrors of the original logical extent.

  ```
  lvsync /dev/<volume group name>/<LV name>
  ```

  For example:

  ```
  lvsync /dev/vg00/stand
  lvsync /dev/vg00/swap
  lvsync /dev/vg00/
  ```

  At this stage, your system should be fully functioning. Use the `xstm` command to verify.

CD ROM Drive (Optional)

As an optional component, the J6700 workstations support one slim-line CD ROM drive with an ATAPI (IDE) interface.

Figure 1-4 shows the operating features of the CD ROM drive, and Table 1-3 describes these features.

Figure 1-4. CD ROM Drive Features

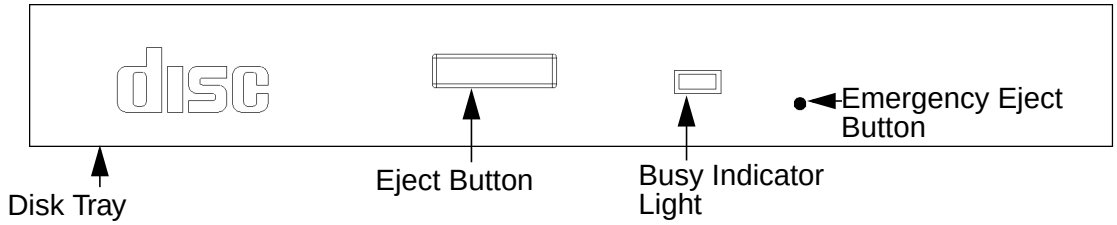


Table 1-3. CD ROM Drive Features

Feature	Purpose
Busy Indicator	• Lights during a data access operation and during a data transfer. • Flashes at a one second rate when a disk is loaded. • Continues to flash if a disk or hardware error is detected. • Flashes at a three second rate while playing an audio disk.
Emergency Eject Hole	Opens the Disk Tray when the end of a paper clip is inserted into it. Used when the workstation does not have power and the Disk Tray cannot be opened by pressing the Eject Button.
Eject Button	Opens the Disk Tray so that a CD ROM disk may be inserted in it or removed from it. When the drive is in use, press the Eject Button for more than one second to open the Disk Tray. The Disk Tray does not open if the workstation power is off.
Disk Tray	Holds the CD ROM disk. (Note that this style of CD ROM drive does not use a disk caddy.)

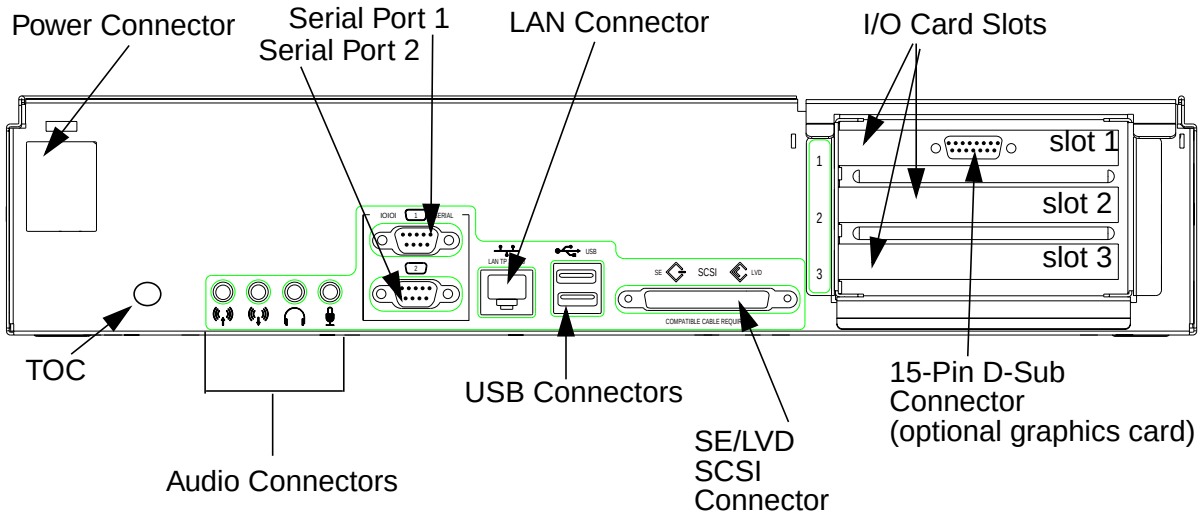
Rear Panel Components

This section describes the following components on the system unit's rear panel. Figure 1-5 shows the locations of these rear panel components.

- Power cord connector
- Transfer of Control (TOC) Button
- Audio connectors
- Two serial ports
- 802.3 Twisted Pair (TP) LAN connector
- Two USB connectors
- Single-Ended/Low-Voltage Differential (SE/LVD) SCSI connector

NOTE To maintain FCC/EMI compliance, verify that all cables are fully seated and properly fastened.

Figure 1-5. System Unit Rear Panel Connectors



Connectors on the Rear Panel

Power Cord Connector

Plug the power cord into the power cord connector to provide AC power to the workstation. The J6700 power cord is rated at 15A for a 100–120V source.

RS-232C Serial Connectors

You can attach a variety of pointing devices (such as a mouse or trackball) or peripheral devices (such as printers, plotters, modems, and scanners) to the RS-232C Serial Input/Output (SIO) ports on this workstation. Consult the documentation that accompanies the device for specific information concerning its use.

LAN 10/100 BaseT RJ45 Connector

Your workstation has a built-in Twisted Pair (TP) connector for the 802.3 (ETHERNET) or 10 BaseT/100 BaseT network. Your workstation will automatically select the correct network setting.

USB Connectors

The two Universal Serial Bus (USB) connectors support only the HP keyboard, mouse, or hub (D6804A). You can connect the HP keyboard, mouse, or hub in either of the USB connectors.

The USB mouse and keyboard were shipped with your system unit. The HP hub can be ordered separately. Note that you should consult the documentation that accompanies each input device for specific information concerning its use.

For more information on the Universal Serial Bus, use your browser to access the following URL: http://www.usb.org.

HP Hub for USB Devices

The HP USB hub provides you with the ability to connect more than two USB devices to the workstation, as well as the ability to extend the USB device's cable length. As an example, you may desire to locate the workstation's keyboard and mouse at a greater distance from the workstation, but the keyboard and mouse cables are not long enough. To increase the cable length, you must make use of the USB hub's extra cable length and connect the hub's cable to one of the two connectors on the back of the workstation. You then connect the keyboard and mouse into their separate connectors on the USB hub.

SCSI Connectors

There is one Single-Ended/Low-voltage Differential (SE/LVD) SCSI connector on the rear panel. This connector will support SE SCSI and LVD SCSI, but not both at the same time. Use the SCSI connector to connect external SCSI devices such as hard disk drives, optical disk drives, DDS-format tape drives, and CD ROM drives.

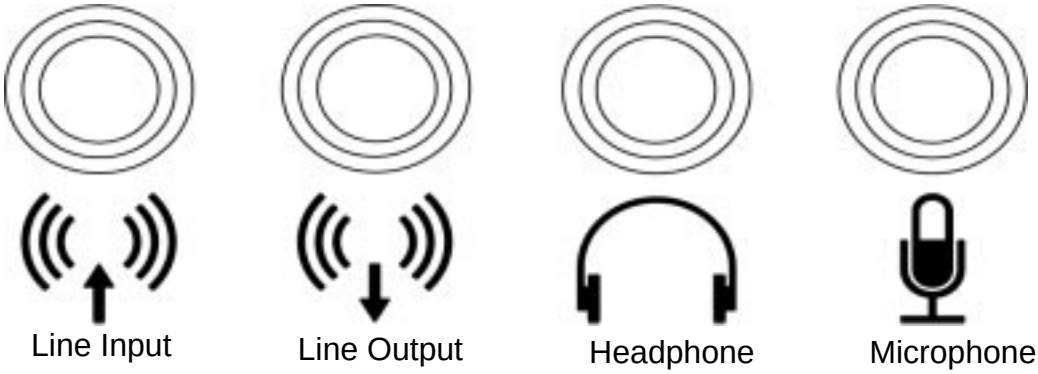
Consult the documentation that accompanies each SCSI device for specific information concerning its use. Also see Appendix C, "SCSI Connections," for information about connecting SCSI devices to the J6700 workstations.

CAUTION Do *not* mix NSE and LVD SCSI devices on the same SCSI bus as this can cause reduction of device performance.

Audio Connectors

Your workstation has audio input and output capability through external input and output connectors on the rear panel and through an internal speaker. The rear panel contains the line input jack, line output jack, headphone jack, and microphone jack connectors.

Figure 1-6. Audio Connectors



The audio connectors are standard stereo audio mini-jacks. Hewlett-Packard recommends using gold-plated plugs available through audio retailers for best quality recording and playback through the external connectors. Table 1-4 on the next page provides a summary of the audio electrical specifications.

Table 1-4. Audio Electrical Specifications

Frequency Response	25 Hz to 20 kHz
Input Sensitivity/Impedance: – Line in – Microphone	 2.0 Vpk/47 Kohm 22 mVpk/1 Kohm

Table 1-4. Audio Electrical Specifications

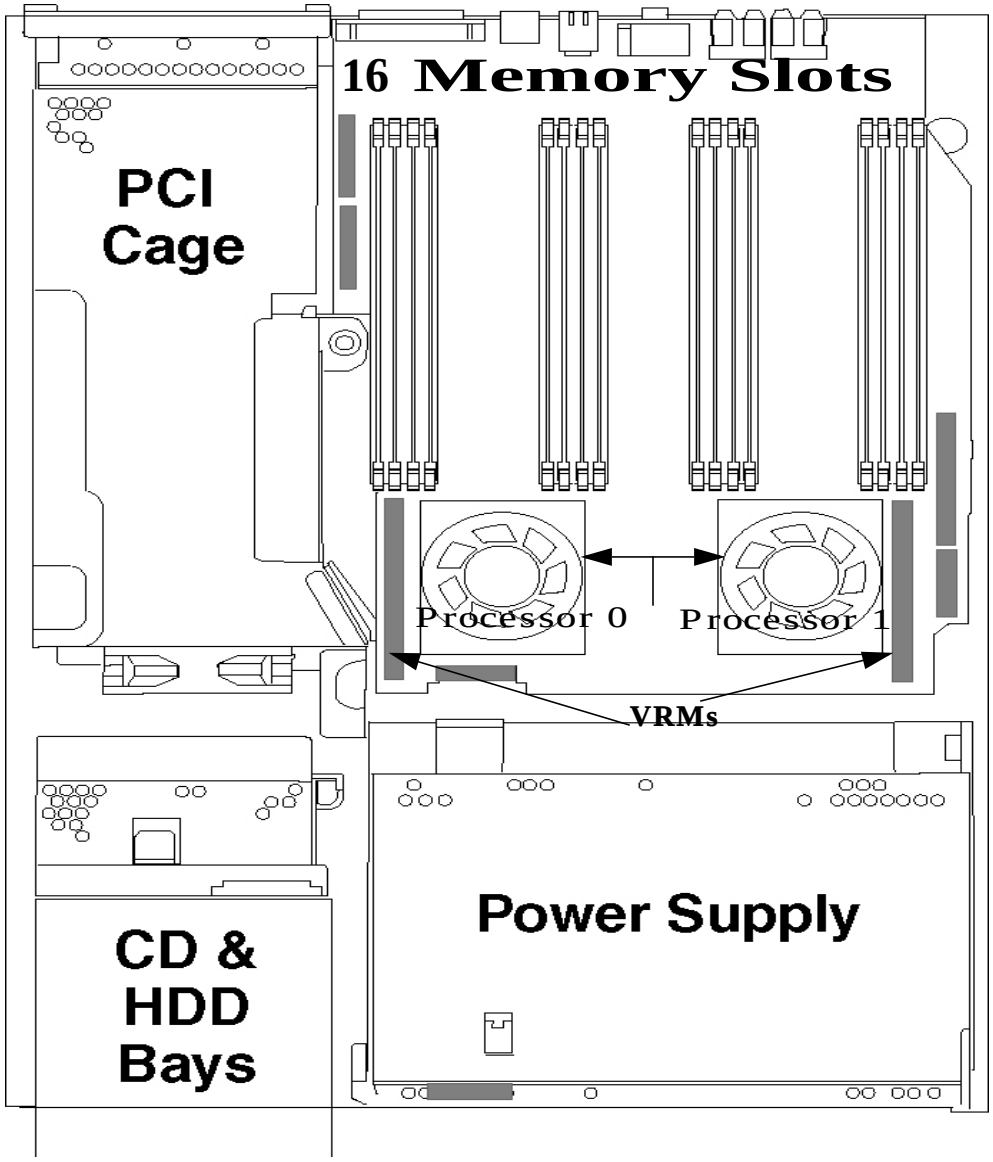
Maximum Output Level/Impedance: – Line out – Headphones – Speaker (internal)	 2.8 Vpp/47 Kohm 2.8 Vpp/50 ohm 5.9 Vpp/48 ohm
Output Impedance: – Line out – Headphones	 619 ohm 118 ohm

Internal Components

This section describes the internal components of the J6700 workstations.

For instructions on how to remove the workstation's top panel in order to access these internal components, as well as instructions on how to remove and replace these internal components to service them, see Chapter 4.

Figure 1-7. Internal Components of the J6700



System Board

The system board in the J6700 contains the PA-RISC microprocessors, memory slots, and PCI cage as well as connectors to other components.

Microprocessors

The J6700 has two PA-8700 microprocessors with operating frequencies of 750MHz. Each processor has 0.75 MB instruction cache and a 1.5 MB data cache. Each microprocessor is cooled by a “turbocooler” which consists of a cylindrical heat sink and an integrated fan.

Power Supply

The power system is comprised of one apparent power factor 500W output power supply. The maximum power needed by a fully-configured SPU is 715W input power. The temperature sensor is located in the front of the power supply. The power supply weighs approximately 8 lbs. (4 kg.). Please note that the system speaker is located in the power supply.

CAUTION HP does not recommend and does not support the use of “ferro-active” or “ferro-resonant” power correction in conjunction with the J6700 workstation. This type of line conditioner represents an older technology that is not compatible with the most recent designs in active Power Factor Correction (PFC) power supplies such as those in the HP J6700 workstations. “Ferro-active” or “ferro-resonant” line conditioners may cause an increase in total harmonic distortion and may produce significant and unpredictable voltage regulation anomalies.

PCI Cage

The PCI (Peripheral Connect Interface) cage is located on the left side of the system board, behind the CD ROM and hard disk drive bays. There are three PCI-4X, 64 bit, 3.3v, 66 MHz slots which provide I/O expansion capabilities for the workstation. There are no primary and secondary card slots.

CD ROM and Hard Disk Drive Bays

The J6700 supports two Low-Voltage Differential (LVD) SCSI hard disk drives (one standard and one optional) and one optional ATAPI slim-line CD ROM drive. The internal SCSI Bus is independent of the external SCSI Bus.

The hard disk drives are hot-pluggable. More information on this was provided earlier in this chapter in the Hard Disk Drive section.

Voltage Regulator Modules (VRMs)

NOTE These VRMs are designed to function ONLY with the J6700 power supply. The output is 2VDC. The maximum current is 52A.

Monitors

The J6700 workstations currently support the following HP monitors:

- 19-inch (18.3-inch viewable) VGA 1600×1200 color monitor (Product Number A4575A)
- 21-inch (19.9-inch viewable) VGA 1600×1200 color monitor (Product Number A4576A)
- 18.1-inch L1800 color flat panel display VGA up to 1280×1024 (Product Number D5065W)
- 19-inch (18-inch viewable) display VGA 1600x1200 (Product Number D8910W)
- 21-inch (19.8-inch viewable) display VGA 1800x1440 (Product Number D2847A)
- 24-inch (22.5-inch viewable) display VGA 1920x1200 (Product Number A1295A)

Keyboard

The standard USB keyboard (Product Number A4983-604*xx* – the actual suffix number depends on the localized version of the keyboard) with the J6700 workstations is a 104-key input device. It is a PC-104 compatible keyboard.

Mouse

The USB mouse is either a scroll wheel type mouse (Product Number A4983-60101) where the scroll wheel also serves as the middle button, or a true three-button type mouse (Product Number A4983-60111).

Site Preparation and Installation

For information on:

- Preparing customers' sites for the delivery and installation of J6700 workstations, refer to the *HP VISUALIZE J6000 Site Preparation Guide* (www.docs.hp.com)
- Installing J6700 workstations, refer to the *QuikInstall Poster* which came with the workstation (Part Number A5991-90000) and the *Getting Started Guide - HP VISUALIZE J6700 Workstation* (Part Number A5990-90021).

For a listing of documentation for the J6700 workstations, see Appendix D.

2 Configuration

This chapter provides details about setting up and changing the system configuration for HP VISUALIZE J6700 workstations.

Chapter Overview

This chapter contains the following main sections:

- Workstation Configurations
- Field Replaceable Unit (FRU) Configurations
  - — Internal Storage Devices
  - — Memory
  - — I/O Cards

Workstation Configurations

Refer to the HP Workstations web site for a complete list of supported accessories, peripherals, and operating system versions for the J6700 workstations. The URL for the web site is:

```
http://www.hp.com/workstations/
```

Field Replaceable Unit (FRU) Configurations

This section provides information for setting up or changing the configuration of the Field Replaceable Units (FRUs) for the J6700 workstations.

Internal Storage Devices

Hard Disk Drive Configuration

The SCSI IDs for hard disk drives are hard-wired into the SCA Ultra2 Wide LVD SCSI interfaces in the backplane of the two disk bays within the J6700 workstations. Hence, SCSI IDs do not need to be set for the hard disk drives installed in these workstations. From top to bottom, the pre-set SCSI IDs for hard disk drives are: 6 and 5.

Similarly, no jumpers are installed at the factory, nor is any jumper installation required at the customer's site, on either of the hard disk drive models that are supported with the J6700 workstations. Both hard disk drive models may be installed as is into these workstations.

Memory

There is a label on the inside cover of the workstation which shows the J6700's memory loading sequence.

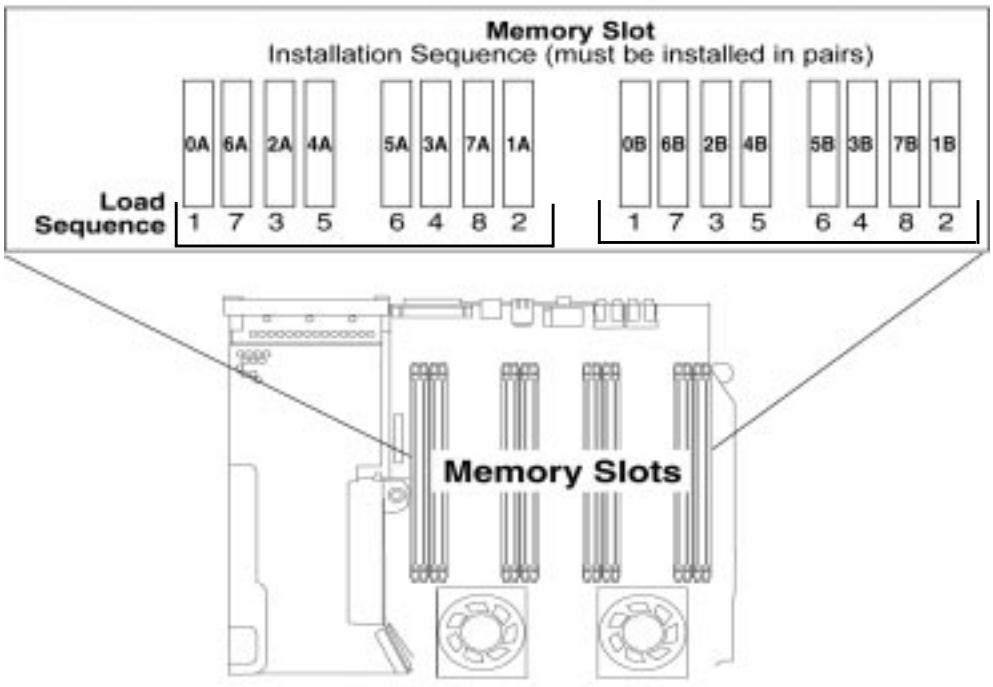
J6700 Memory Configuration

The J6700 workstation has sixteen memory slots, labeled 0A, 0B to 7A, 7B. Memory DIMMs *must* be installed in pairs in this workstation, and both DIMMs in each pair *must* be of equal size. The DIMMs for this workstation currently come in 512 MB and 1 GB sizes. This workstation comes with two 512 MB DIMMs as its standard configuration from the factory. Thus, currently the minimum memory configuration for this workstation is 1GB, and the maximum is 16 GB.

DIMMs should be loaded in the order shown with 0A, 0B being the first pair of DIMMs loaded, and 7A, 7B being the last pair loaded. Figure 2-1 shows the installation sequence.

NOTE If memory is installed improperly or it is bad and fastboot is not enabled, your workstation's operating system will not boot-up and a DIMM error will appear in your workstation's LCD. For more information see the section "Displaying and Setting Fastboot Mode" in Chapter 5.

Figure 2-1. Memory Loading Sequence in the J6700



I/O Cards

The three I/O slots located in the PCI cage area of the J6700 workstations are 64-bit, 4x, 3.3v, 66 MHz PCI (Peripheral Connect Interface) slots, providing I/O expansion capabilities for the J6700 workstations.

CAUTION The J6700 workstations supply about 75 Watts of power to the PCI slots. Do not insert I/O cards that together draw more than 75 Watts, or damage to the workstation may result. Please look at the specifications that come with your individual I/O cards for power requirements. Note that each PCI slot can provide up to 25 watts.

3 Troubleshooting

This chapter provides information about isolating a failing component, known as a Field Replaceable Unit (FRU), in HP VISUALIZE J6700 workstations.

Chapter Overview

This chapter contains the following main sections:

- Introduction to Troubleshooting
- Flowcharts for Troubleshooting
- Dealing with a Boot Failure
- Identifying LCD-Indicated Conditions
- Running System Verification Tests
- Running ODE-Based Diagnostics
- LED Diagnostics

Introduction to Troubleshooting

To troubleshoot HP VISUALIZE J6700 workstations, you must be familiar with the HP-UX operating system and be able to start and stop processes. You should also be familiar with the boot ROM diagnostics, ISL diagnostics, and the Support Tools Manager online tests, which are described in this chapter.

First note any error or status messages, and then run the power-up boot ROM diagnostics, known as Selftest. If the Selftest diagnostics fail, replace the FRU that is indicated. If the tests pass but you still suspect a problem, run the ISL diagnostics and the Support Tools Manager online tests.

For a complete description of using ISL diagnostics and using the Support Tools Manager, see the *Support Media User's Manual* (Part Number B3782-90176).

Flowcharts for Troubleshooting

The following four figures contain troubleshooting flowcharts you can follow to isolate a failing Field Replaceable Unit (FRU). Figure 3-1 on the next page contains the main troubleshooting flowchart. Figures 3-2 through 3-4 on the following pages contain the flowcharts for console, bootable device, and HP-UX troubleshooting, respectively.

Figure 3-1. Main Flowchart for Troubleshooting

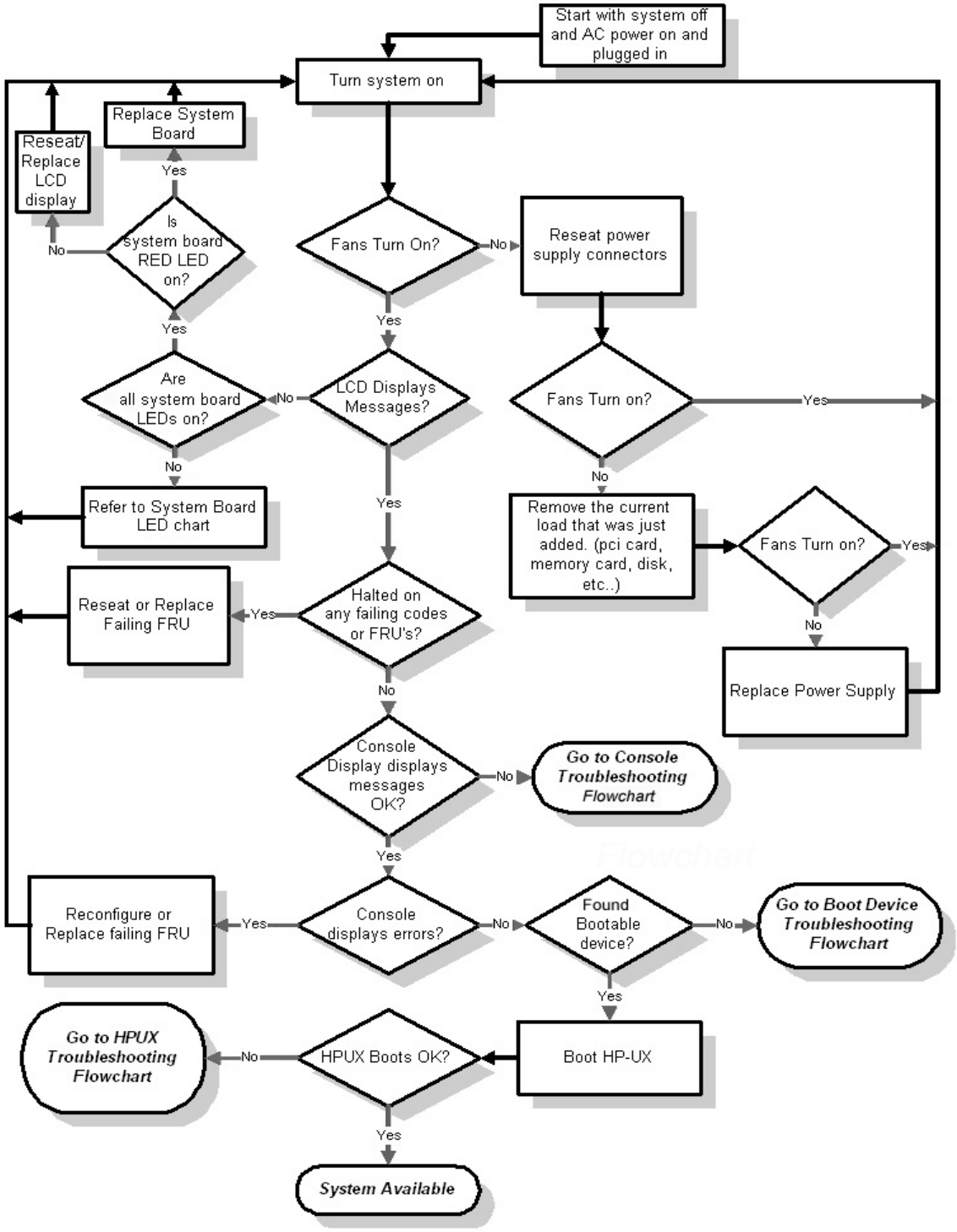


Figure 3-2. Console Troubleshooting Flowchart

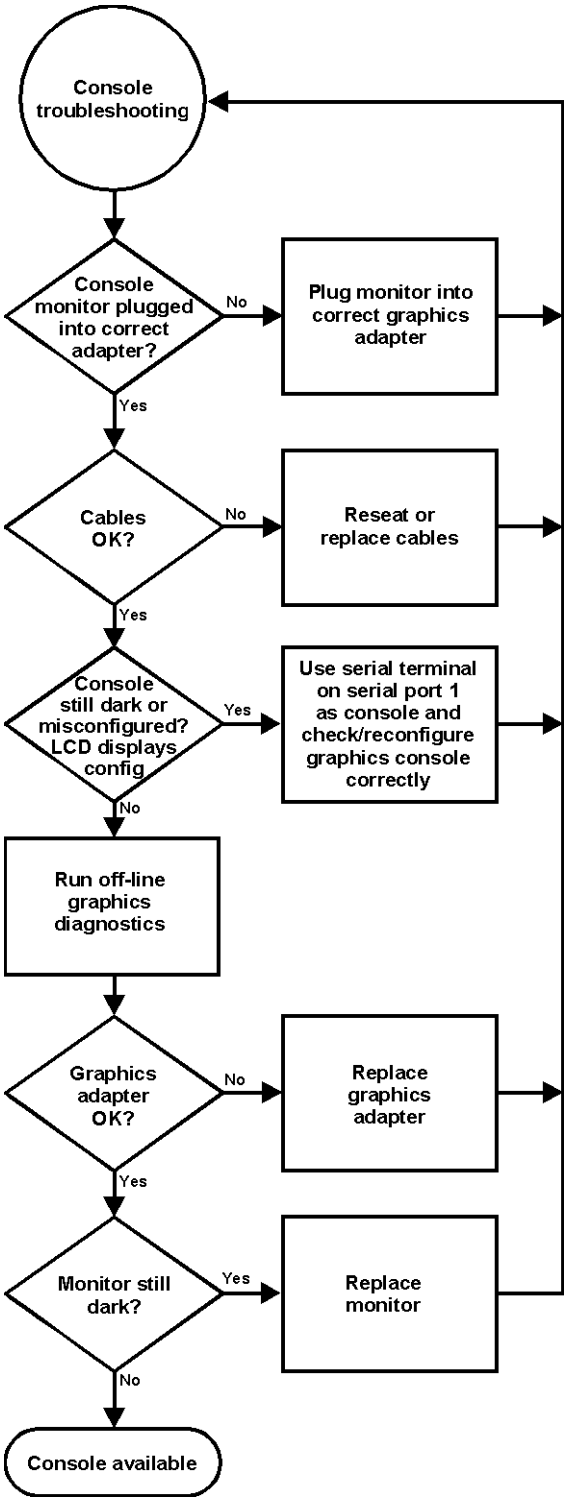


Figure 3-3. Bootable Device Troubleshooting Flowchart

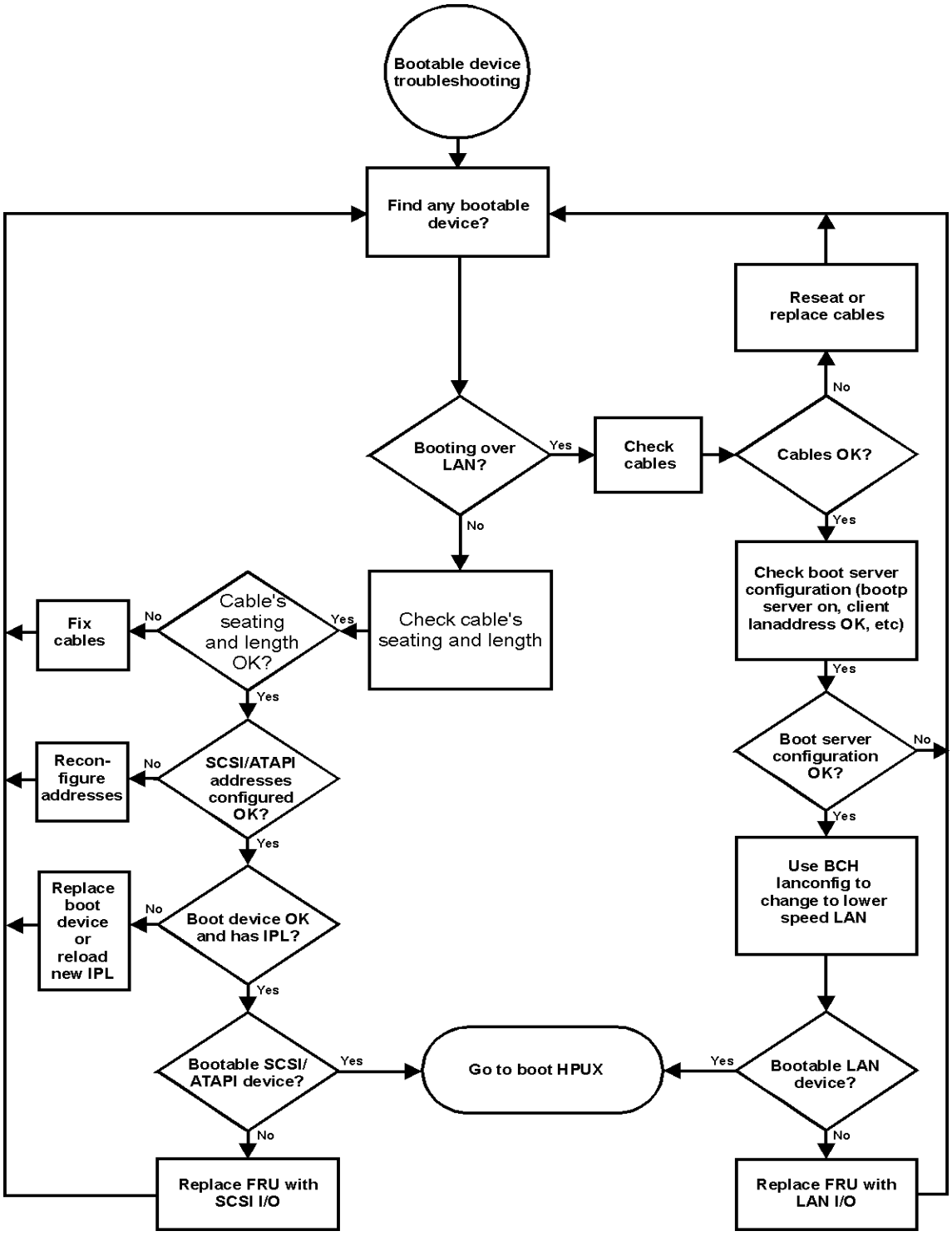
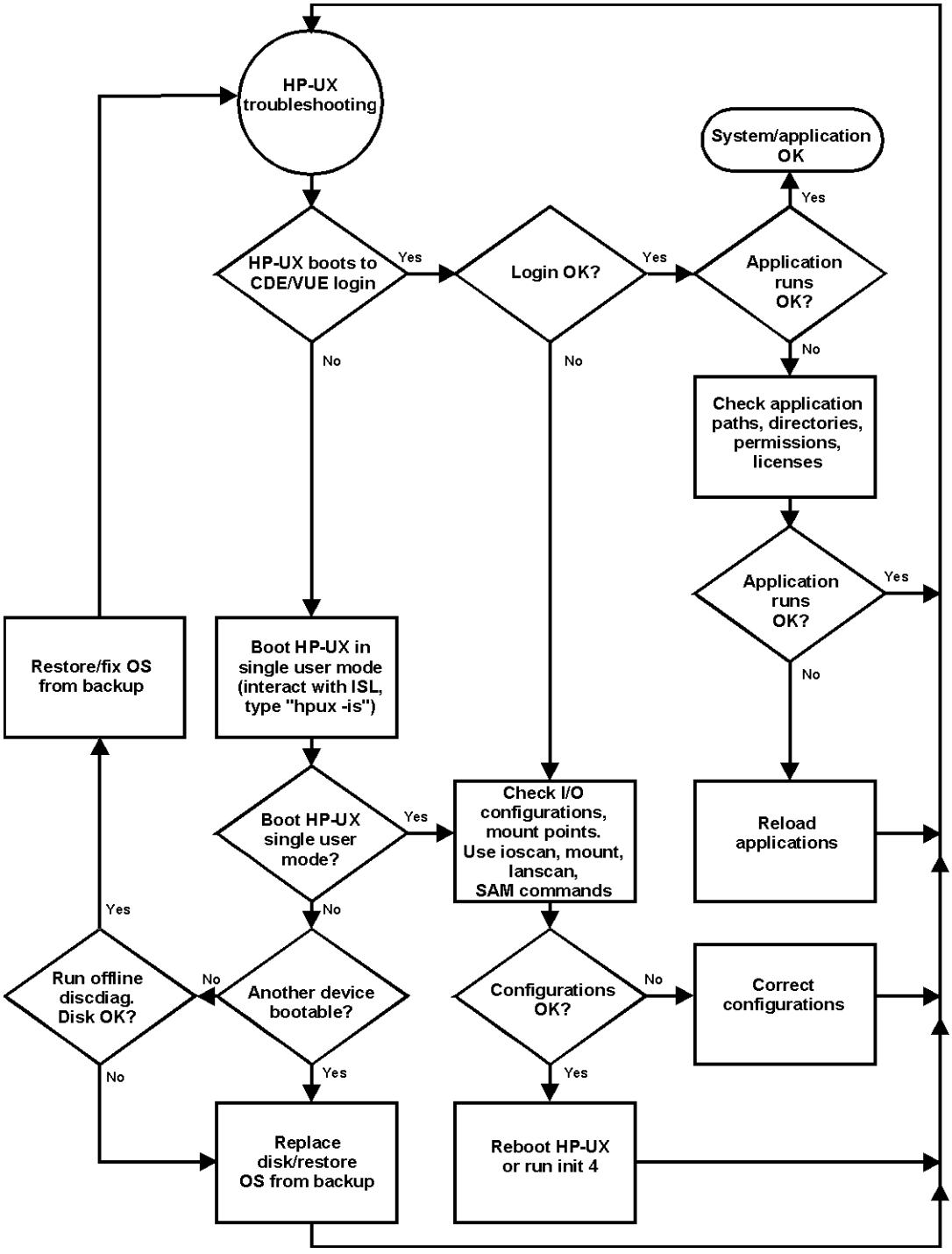


Figure 3-4. HP-UX Troubleshooting Flowchart



Dealing with a Boot Failure

This section contains information for searching for bootable media, stable storage, boot command notations, supported boot paths and the Intermediate System Loader (ISL) environment. Some of the examples in this section require the use of the Boot Console Handler, which is discussed in Chapter 5 of this handbook.

Special Considerations

When dealing with boot failures, you will need to consider the scenarios in this section.

- To boot from a known device containing a bootable operating system, type the following at the prompt:

  ```
  Main Menu: Enter command > boot device [Enter]
  ```

  where *device* is the hardware path to the device, specified in Mnemonic Style Notation.

  Example: to boot an operating system stored on an IDE CD ROM, go to the Main Menu of the Boot Console Handler and then type the following command at the prompt:

  ```
  Main Menu: Enter command > boot ide [Enter]
  ```

  The operating system on the specified device is used to start the workstation.

- To interact with the Initial System Loader (ISL) before booting the workstation, type the following at the prompt:

  ```
  Main Menu: Enter command > boot device [Enter]
  ```

  You are prompted: `Interact with ISL (Y or N) > y [Enter]`

  Answering yes (`y`) causes the ISL to be loaded from the specified device. After a short time, the following prompt appears on the screen:

  ```
  ISL>
  ```

  ISL is the program that actually controls the loading of the operating system. By interacting with ISL, you can choose to load an alternate version of the HP-UX operating system.

  For example, if the usual kernel (`/stand/vmunix`) on the root disk has become corrupted, boot the workstation from the backup kernel (`/stand/vmunix.prev`) by typing the following at the `ISL>` prompt:

  ```
  ISL> hpux /stand/vmunix.prev [Enter]
  ```

- To find the location of the bootable operating systems on the various media in the file system, use the `search ipl` command. See the next subsection, “Searching for Bootable Media.”

Searching for Bootable Media

To list all devices that contain bootable media, go to the Main Menu of the Boot Console Handler, and then type the following at the prompt:

```
Main Menu: Enter command > search ipl [Enter]
```

The `search` command searches all buses. The search may turn up more devices than there are lines on the display. If you are using a text terminal, you can control the progress of the search from the terminal's keyboard by doing any of the following:

- To temporarily suspend the search, press `[Ctrl]-[S]`.
- To continue the search, press `[Ctrl]-[Q]`.
- To halt the search, press any other key.

These flow-control commands do not work with a bitmapped display, but such a display can show more than forty lines of text, so you are unlikely to need them.

To search for devices of just one type that actually contain bootable media, go to the Main Menu of the Boot Console Handler, and then type the following at the prompt:

```
Main Menu: Enter command > search ipl device_type [Enter]
```

where *`device_type`* is one of the following:

- `fwscsi` is the internal, Ultra2 Wide LVD (Low Voltage Differential) SCSI bus.
- `scsi` is the external SE/LVD SCSI bus.
- `lan` is all connections to the built-in LAN.
- `ide` is the built-in CD ROM drive.
- `pci`*`n`* is an optional SCSI interface in slot number *n*.

Stable Storage

Stable Storage is non-volatile memory associated with the PA-RISC processor module. Stable Storage is used by the processor (CPU) to store device path information, the state of the boot flags, HPMC error information, and operating system initialization data.

Boot Command Notations

The boot command supports the following two notations:

- Mnemonic
- Path number

Type `help scsi` or `help lan` for more information on the boot path parameters.

Here are examples of mnemonic notation:

- `boot` with no parameters selects the primary boot path in stable storage.
- `boot` with the `alternate` or `alt` parameter selects the alternate boot path in stable storage.

Here is an example of path number notation:

- `boot p1 [Enter]` attempts to boot from the second path in a list generated by a previous `search` command.

Supported Boot Paths

SCSI devices are bootable when connected to any SCSI port on the system. Workstations can only boot from the built-in LAN port. The workstation can be booted from the CD ROM drive for software installation.

Intermediate System Loader (ISL) Environment

The ISL environment provides the means to load the operating system (HP-UX) environment. The ISL environment also provides an offline platform to execute diagnostic and utility programs from a boot device when HP-UX does not load.

The ISL program is the first program loaded into main memory from an external media (LAN, disk, or tape) and launched by the initial program loader (IPL) routine during the Boot Administration environment.

The ISL environment provides the following capabilities:

- Execute user-entered commands to modify boot device paths and boot options in stable storage.
- Run off-line diagnostic programs and utilities.
- Provide automatic booting of the HP-UX operating system after power-on or reset.

Identifying LCD-Indicated Conditions

This workstation uses a 2-line LCD, with up to 16-characters per line, to display firmware/operating system progress codes. These codes are referred to as chassis codes. The information displayed on the LCD has the following format:

```
XXX YYYY: ZZZZZZ        (Line 1)
AAAAAAAAAAAAAAAA        (Line 2)
```

Where:

XXX	Three-character Operating Status
YYYY	Four-digit hex code identifying the code module being executed
ZZZZZZ	Six-digit FRU descriptor
AAAAAAAAAAAAAAAA	Diagnostic message of up to 16 characters

The 3-character operating status can be one of the following:

FLT (fault)	A hardware error has been detected
TST (test)	Hardware being tested
INI (initialize)	Hardware being initialized
SHU (shutdown)	System being shutdown
WRN (warning)	A non-optimal operating condition exists
RUN (running)	The operating system is running

Selftest Failures

Chassis codes are the key to debugging selftest errors. If a failure is found during selftest, chassis codes are displayed in the system LCD. To debug a failure:

1. In Table 3-1 starting on the next page, find the chassis code listed on the LCD.
2. In the Boot Console Handler, use the Service Menu's `pim`, `pdt`, and `ChassisCodes` commands to get additional information about the failure.

The FRU column in Table 3-1 shows messages printed on the LCD that refer to system FRUs. All codes are listed in numeric order.

Memory Failures

The J6700 workstations require special Memory Page Deallocation to be implemented. This feature allows the workstation to provide information to the operating system about memory failures.

HP-UX uses this information to map out failing memory areas and continue normal operation. You can check the Memory Page Deallocation Table (PDT) using the `pdt` command in the Service menu of the Boot Console Handler (refer to Chapter 5). If a failing DIMM is replaced, use the command `pdt clear` in the Service Menu to clear out the PDT.

Chassis Codes

Table 3-1 lists all of the chassis codes for the J6700 workstations.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
FLT	1*n*01	SYS BD	HPMC occurred	CPU *n* detected an unexpected HPMC.
FLT	1*n*02	SYS BD	powerfail intrpt	CPU *n* detected an unexpected power fail interrupt.
FLT	1*n*03	SYS BD	recvry cntr trap	CPU *n* detected an unexpected recovery counter trap.
FLT	1*n*04	SYS BD	external intrrpt	CPU *n* detected an unexpected external interrupt.
FLT	1*n*05	SYS BD	LPMC occurred	CPU *n* detected an unexpected LPMC.
FLT	1*n*06	SYS BD	ITLB mis/Ipg flt	CPU *n* detected an unexpected ITLB miss or instruction page fault.
FLT	1*n*07	SYS BD	I mem prot trap	CPU *n* detected an unexpected instruction memory protection trap.
FLT	1*n*08	SYS BD	illegal inst trp	CPU *n* detected an unexpected illegal instruction trap.
FLT	1*n*09	SYS BD	break instr trap	CPU *n* detected an unexpected break instruction trap.
FLT	1*n*0A	SYS BD	privilgd op trap	CPU *n* detected an unexpected privileged operation trap.
FLT	1*n*0B	SYS BD	privlgd reg trap	CPU *n* detected an unexpected privileged register trap.
FLT	1*n*0C	SYS BD	overflow trap	CPU *n* detected an unexpected overflow trap.
FLT	1*n*0D	SYS BD	conditional trap	CPU *n* detected an unexpected conditional trap.
FLT	1*n*0E	SYS BD	assist exep trap	CPU *n* detected an unexpected assist exception trap.
FLT	1*n*0F	SYS BD	DTLB mis/Dpg flt	CPU *n* detected an unexpected DTLB miss or data page fault.
FLT	1*n*10	SYS BD	non-acc ITLB mis	CPU *n* detected an unexpected non-access ITLB miss fault.
FLT	1*n*11	SYS BD	non-acc DTLB mis	CPU *n* detected an unexpected non-access DTLB miss or data page fault.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
FLT	1*n*12	SYS BD	data mem prot tr	CPU *n* detected an unexpected data memory protection trap.
FLT	1*n*13	SYS BD	data mem brk trp	CPU *n* detected an unexpected data memory break trap.
FLT	1*n*14	SYS BD	TLB dirty bit tr	CPU *n* detected an unexpected TLB dirty bit trap.
FLT	1*n*15	SYS BD	page refrnce trp	CPU *n* detected an unexpected page reference trap.
FLT	1*n*16	SYS BD	assist emul trap	CPU *n* detected an unexpected assist emulation trap.
FLT	1*n*17	SYS BD	hi-priv xfer trp	CPU *n* detected an unexpected higher-privilege transfer trap.
FLT	1*n*18	SYS BD	lo-priv xfer trp	CPU *n* detected an unexpected lower-privilege transfer trap.
FLT	1*n*19	SYS BD	taken branch trp	CPU *n* detected an unexpected taken-branch trap.
FLT	1*n*1A	SYS BD	data mem acc rts	CPU *n* detected an unexpected data memory access rights trap.
FLT	1*n*1B	SYS BD	data mem prot ID	CPU *n* detected an unexpected data memory protection ID trap.
FLT	1*n*1C	SYS BD	unalign data ref	CPU *n* detected an unexpected unaligned data reference trap.
FLT	1*n*1D	SYS BD	perf mon intrrpt	CPU *n* detected an unexpected performance monitor interrupt.
TST	1*n*20	SYS BD	CPU*n* basic test	CPU *n* is starting its basic operations self-test.
TST	1*n*21	SYS BD	CPU*n* alu test	CPU *n* is starting its arithmetic and logical unit self-test.
TST	1*n*22	SYS BD	CPU*n* branch test	CPU *n* is starting its branch instruction self-test.
TST	1*n*23	SYS BD	CPU*n* arith cond	CPU *n* is starting its arithmetic condition self-test.
TST	1*n*24	SYS BD	CPU*n* bit opers	CPU *n* is starting its bit operation instruction self-test.
TST	1*n*25	SYS BD	CPU*n* cntrl regs	CPU *n* is starting its control register self-test.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
TST	1*n*26	SYS BD	CPU*n* ext intrpt	CPU *n* is starting its external interrupt self-test.
TST	1*n*27	SYS BD	CPU*n* itimer test	CPU *n* is starting its interval timer self-test.
TST	1*n*28	SYS BD	CPU*n* multi-media	CPU *n* is starting its multi-media instructions self-test.
TST	1*n*29	SYS BD	CPU*n* shadow reg	CPU *n* is starting its shadow register self-test.
TST	1*n*2A	SYS BD	CPU*n* diagnse reg	CPU *n* is starting its diagnose register self-test.
TST	1*n*2B	SYS BD	CPU*n* rdr test	CPU *n* is starting its remote diagnose register self-test.
TST	1*n*2C	SYS BD	CPU*n* bypass test	CPU *n* is starting its integer bypass operation self-test.
TST	1*n*30	SYS BD	CPU*n* start est	CPU *n* is starting its early (pre-memory) self-tests.
WRN	1*n*31	SYS BD	CPU*n* skip est	CPU *n* is bypassing its early self-tests to save time.
FLT	1*n*32	SYS BD	CPU*n* bad tst mod	CPU *n* detected an unsupported system mode.
INI	1*n*3C	SYS BD	CPU*n* initialize	CPU *n* is initializing after self-tests.
TST	1*n*3E	SYS BD	CPU*n* exit est	CPU *n* finished its early self-tests.
TST	1*n*A0	SYS BD	CPU*n* fpu tests	CPU *n* is starting its floating-point unit self-tests.
TST	1*n*A1	SYS BD	CPU*n* fpu reg tst	CPU *n* is starting its floating-point register self-test.
TST	1*n*A2	SYS BD	CPU*n* fpu inst	CPU *n* is starting its floating-point instruction self-test.
TST	1*n*A3	SYS BD	CPU*n* fpu traps	CPU *n* is starting its floating-point trap self-test.
TST	1*n*A4	SYS BD	CPU*n* fpu misc	CPU *n* is starting its floating-point miscellaneous operations self-test.
TST	1*n*A5	SYS BD	CPU*n* fpu bypass	CPU *n* is starting its floating-point bypassing self-test.
TST	1*n*B1	SYS BD	CPU*n* TLB RAM tst	CPU *n* is starting its TLB register self-test.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
TST	1*n*B2	SYS BD	CPU*n* TLB trans	CPU *n* is starting its TLB translation self-test.
FLT	1*n*BA	SYS BD	monarch CPU *fail*	The monarch CPU failed.
FLT	1*n*BB	SYS BD	bad CPU*n* number	The CPU identifier was out of range.
FLT	1*n*BF	SYS BD	CPU*n* halt boot	Bootstrap failure--machine halted.
INI	1*n*CA	SYS BD	CPUn sys bus arb	Monarch CPU is initializing the system bus arbitration.
WRN	1*n*CD	SYS BD	CPU*n* deconfig	CPU *n* deconfigured itself.
WRN	1*n*CE	SYS BD	CPU*n* extinguish	PDC_PROC halted CPU *n*.
FLT	1*n*CF	SYS BD	slave*n* failed	Slave CPU *n* failed self-test.
WRN	1*m*D*s*	SYS BD	slaves deconfig	Monarch CPU *m* deconfigured slave CPU *s*.
WRN	1*n*EF	SYS BD	CPU*n* slftst warn	CPU *n* detected a non-fatal error during its self-tests.
WRN	1*m*F*s*	SYS BD	mon*m* stop slave*s*	Monarch CPU *m* halted slave CPU *s*.
INI	1*n*FC	SYS BD	CPUn sync'ing	CPU *n* is synchronizing with the rest of the system.
INI	1*n*FD	SYS BD	CPU*n* stat wd tst	CPU *n* is testing the system status word.
FLT	1*n*FF	SYS BD	monarch*n* selftst	Monarch CPU *n* failed self-test.
TST	2*n*20	SYS BD	CPU*n* icache RAM	CPU *n* is starting its instruction cache RAM self-test.
FLT	2*n*25	SYS BD	CPU*n* ic ld d err	CPU *n* detected a data error during data cache load.
FLT	2*n*26	SYS BD	CPU*n* ic ld t err	CPU *n* detected a tag error during data cache load.
TST	2*n*30	SYS BD	CPU*n* icache tag	CPU *n* is starting its instruction cache tag self-test.
TST	2*n*40	SYS BD	CPU*n* icache par	CPU *n* is starting its instruction cache parity detection self-test.
TST	2*n*50	SYS BD	CPU*n* dc stor que	CPU *n* is starting its data cache store queue self-test.
FLT	2*n*51	SYS BD	CPU*n* dc st q err	CPU *n* detected an error during its data cache store queue self-test.
TST	2*n*70	SYS BD	CPU*n* dcache RAM	CPU *n* is starting its data cache RAM self-test.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
TST	2*n*80	SYS BD	CPU*n* dcache tag	CPU *n* is starting its data cache tag self-test.
TST	2*n*90	SYS BD	CPU*n* dcache ECC	CPU *n* is starting its data cache ECC self-test.
FLT	2BAD	SYS BD	assertion fail	A firmware assertion failed.
TST	3*n*00	SYS BD	ROM checksum tst	Monarch CPU *n* is testing the boot ROM integrity.
FLT	3*n*00	SYS BD	ROM checksum BAD	The boot ROM failed checksum.
INI	3*n*00	SYS BD	ROM checksum ok	The boot ROM passed checksum.
TST	3*n*01	SYS BD	PDH control test	Monarch CPU *n* is testing PDH control register.
INI	3*n*01	SYS BD	PDH control init	Monarch CPU *n* is initializing the PDH control register.
FLT	3*n*01	SYS BD	PDH control err	Monarch CPU *n* detected an error in the PDH control register.
TST	3*n*02	SYS BD	scratch RAM test	Monarch CPU *n* is testing scratch RAM.
INI	3*n*02	SYS BD	scratch RAM ok	The scratch RAM test failed.
FLT	3*n*02	SYS BD	scratch RAM bad	The scratch RAM test passed.
WRN	3*n*03	SYS BD	stbl st read err	CPU *n* detected a non-fatal error reading the stable store.
FLT	3*n*03	SYS BD	stbl st read err	CPU *n* detected a non-fatal error reading the stable store.
INI	3*n*C4	SYS BD	clearing EEPROM	Monarch CPU *n* is clearing the EEPROM.
INI	3*n*D4	SYS BD	deflting EEPROM2	Monarch CPU *n* is initializing the EEPROM to system defaults.
WRN	3*n*04	SYS BD	EEPROM write err	CPU *n* detected a non-fatal error writing the EEPROM.
FLT	3*n*04	SYS BD	EEPROM write err	CPU *n* detected a fatal error writing the EEPROM.
FLT	3*n*05	SYS BD	EEPROM wrt limit	CPU *n* detected a fatal error writing the EEPROM.
WRN	3*n*06	SYS BD	EEPROM read err	CPU *n* detected a non-fatal error reading the EEPROM.
FLT	3*n*06	SYS BD	EEPROM read err	CPU *n* detected a fatal error reading the EEPROM.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
INI	3*n*07	SYS BD	CPU*n* invoke LDB	CPU *n* is starting the low-level debugger.
FLT	3*n*09	SYS BD	bad sys mde byte	CPU *n* detected an unsupported system mode.
WRN	3*n*1A	SYS BD	hversion mismtch	Stable store hardware version doesn't match system.
TST	3*n*1B	SYS BD	chck model strng	Check model string with version in stable store.
WRN	3*n*1B	SYS BD	model str msmtch	Model string doesn't match that in stable store.
FLT	3*n*1B	SYS BD	fatal model str	Error reading model string from stable store.
TST	3*n*1C	SYS BD	test software ID	Check LANIC address.
WRN	3*n*1C	SYS BD	update sw ID	Update LANIC address.
FLT	3*n*1C	SYS BD	update sw ID err	Error updating LANIC address.
INI	3*n*2*s*	SYS BD	Invoke LDB: *s*	CPU *n* is awaiting the low-level debugger for *s* more seconds.
TST	3*n*BC	IO BD	test sys clocks	CPU *n* is verifying processor clocks with the real-time clock.
INI	3*n*BC	SYS BD	init sys clocks	CPU *n* has initialized the processor clocks.
FLT	3*n*BC	IO BD	RTC tick timeout	The real-time clock is ticking too slowly or not at all.
TST	3*n*CD	SYS BD	check defaults	CPU *n* is initializing stable store values to system defaults.
INI	3*n*CD	SYS BD	init defaults	CPU *n* finished initializing stable store values.
FLT	3*n*CD	SYS BD	init EEPROM err	CPU *n* detected an error writing to stable store.
FLT	3*n*EC	SYS BD	bad sys config	CPU *n* detected an illegal CPU board configuration.
FLT	3*n*F4	SYS BD	EEPROM boot limt	CPU *n* detected a fatal error writing the EEPROM.
FLT	3*n*FC	SYS BD	bad sys bd id	CPU *n* cannot identify CPU board.
TST	4*n*00	SYS BD	CPU*n* start lst	CPU *n* is starting its late (with memory) self-tests.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
WRN	4*n*01	SYS BD	CPU*n* skip lst	CPU *n* is bypassing its late self-tests to save time.
TST	4*n*0E	SYS BD	CPU*n* exit lst	CPU *n* finished its late self-tests.
TST	4*n*20	SYS BD	CPU*n* lst erly st	CPU *n* is re-executing some of its early self-tests from system memory.
TST	4*n*21	SYS BD	CPU*n* lst basic	CPU *n* is re-executing its basic operations self-test.
TST	4*n*22	SYS BD	CPU*n* lst alu	CPU *n* is re-executing its arithmetic and logic unit self-test.
TST	4*n*23	SYS BD	CPU*n* lst branch	CPU *n* is re-executing its branch instruction self-test.
TST	4*n*24	SYS BD	CPU*n* lst arth cd	CPU *n* is re-executing its arithmetic conditions self-test.
TST	4*n*25	SYS BD	CPU*n* lst bit ops	CPU *n* is re-executing its bit operations self-test.
TST	4*n*26	SYS BD	CPU*n* lst ctl reg	CPU *n* is re-executing its control register self-test.
TST	4*n*27	SYS BD	CPU*n* lst ext int	CPU *n* is re-executing its external interrupt self-test.
TST	4*n*28	SYS BD	CPU*n* lst itimer	CPU *n* is re-executing its interval timer self-test.
TST	4*n*29	SYS BD	CPU*n* lst mltimed	CPU *n* is re-executing its multi-media instructions self-test.
TST	4*n*2A	SYS BD	CPU*n* lst shadow	CPU n is re-executing its shadow register self-test.
TST	4*n*2B	SYS BD	CPU*n* lst dg regs	CPU *n* is re-executing its diagnose register self-test.
TST	4*n*2C	SYS BD	CPU*n* lst rdrs	CPU *n* is re-executing its remote diagnose register self-test.
TST	4*n*2D	SYS BD	CPU*n* lst bypass	CPU *n* is re-executing its integer bypass operation self-test.
TST	4*n*30	SYS BD	CPU*n* cache byte	CPU *n* is starting its data cache sub-word operations self-test.
TST	4*n*40	SYS BD	CPU*n* cache flush	CPU *n* is starting its cache flush self-test.
TST	4*n*50	SYS BD	CPU*n* icache miss	CPU *n* is starting its instruction cache miss self-test.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
TST	4*n*60	SYS BD	CPU*n* dcache miss	CPU *n* is starting its data cache miss self-test.
FLT	5*n*00	SYS BD	unknown bus err	CPU *n* detected an unknown error on the system bus (Runway).
FLT	5*n*02	SYS BD	path err assertd	CPU *n* detected a path error on the system bus (Runway).
FLT	5*n*04	SYS BD	data parity err	CPU *n* detected a data, address, or control parity error on the system bus (Runway).
FLT	5*n*07	SYS BD	Runway dir error	CPU *n* detected a directed error on the system bus (Runway).
FLT	5*n*08	SYS BD	Runway broad err	CPU *n* detected a broadcast error on the system bus (Runway).
FLT	5*n*0A	SYS BD	illegal response	CPU *n* received data that did not match any outstanding data request.
FLT	5*n*0B	SYS BD	bus timeout	CPU *n* timed out before receiving requested data. The responder is logged in the system responder address.
FLT	5*n*0C	SYS BD	CPU sync failure	CPU *n*'s synchronizer detected a rule violation on the system bus (Runway).
INI	7000	DIMM	start DIMM scan	Start looking for installed DIMMs.
INI	7002	SYS BD	init mem tables	Initialize memory data structures.
FLT	7004	SYS BD	mem plt upd fail	Error updating memory platform data.
FLT	7005	DIMM	insufficient mem	Insufficient memory detected to continue.
TST	7010	DIMM	check DIMM order	Start memory DIMM order check.
WRN	7011	DIMM	skip DIMM ord ck	Bypass memory DIMM order check.
FLT	7012	DIMM	DIMM order error	Memory DIMMs are not in the proper order.
FLT	7013	DIMM	DIMM order error	Memory DIMMs are not in the proper order. As a result, the system cannot access one or more DIMMs and has deallocated all inaccessible DIMMs.
TST	7016	DIMM	DIMM pair check	Start memory DIMM pair check (DIMMs in a pair (e.g. 0a/0b) must match in J7xxx).
WRN	7017	DIMM	skip mem pair ck	Bypass memory DIMM set check.
FLT	701F	DIMM	no memory found	Memory scan couldn't find any DIMMs.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
TST	7020	SYS BD	search for IMM	Try to find a single memory bank to use for the initial memory module.
TST	703*s*	DIMM	DIMM *s* IMM vrfy	DIMM *s* was the initial memory module last boot. Verify it still works.
FLT	704*s*	DIMM	DIMM *s* IMM fail	DIMM *s* failed the initial memory module test.
TST	705*s*	DIMM	DIMM *s IMM test*	Test DIMM in slot *s* as the initial memory module.
INI	706*s*	DIMM	DIMM *s* is IMM	DIMM *s* chosen as initial memory module.
INI	70F0	DIMM	DIMM scan done	Memory DIMM scan complete.
TST	7100	SYS BD	mem register tst	Start testing registers in memory controller.
WRN	7101	SYS BD	skip mem reg tst	Bypass the memory controller register test.
FLT	7102	SYS BD	mem addr reg tst	Firmware detected an error in the memory controller address registers.
FLT	7103	SYS BD	mem mbat reg tst	Firmware detected an error in the memory controller bank registers.
FLT	7104	SYS BD	mem reg tst fail	Firmware detected an error in the memory controller memory registers.
FLT	7105	SYS BD	mem err reg test	Firmware detected an error in the memory controller error registers.
FLT	7106	SYS BD	mem err clr fail	Firmware was unable to clear the error registers after testing.
INI	7200	DIMM	strt DIMM detect	Start the Serial Presence Detection (SPD) to search for memory DIMMs.
INI	7201	DIMM	DIMM detect *x*%	SPD is *x*% finished.
WRN	7202	SYS BD	skip DIMM detect	Bypass Serial Presence Detection.
FLT	7203	DIMM	unsupp DIMM type	SPD found an unsupported DIMM type.
FLT	7204	DIMM	SPD fatal error	SPD detected an unexpected, fatal error.
INI	7205	DIMM	add HP DIMM type	New HP manufactured DIMM type added to tables.
INI	7206	DIMM	non-HP DIMM type	New non-HP DIMM type added to tables (use at own risk).

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
FLT	7207	DIMM	DIMM table full	The DIMM table is full--cannot add new type.
FLT	7208	DIMM	no DIMMs found	SPD didn't find any memory DIMMs.
INI	721*s*	DIMM	is DIMM *s* inst?	SPD is checking memory slot *s*.
INI	722*s*	DIMM	???? DIMM in *s*	SPD found a DIMM in slot *s*, but can't determine its size. DIMM will not be used.
INI	723*s*	DIMM	128M DIMM in *s*	SPD found a 128MB DIMM in slot *s*.
INI	724*s*	DIMM	256M DIMM in *s*	SPD found a 256MB DIMM in slot *s*.
INI	725*s*	DIMM	512M DIMM in *s*	SPD found a 512MB DIMM in slot *s*.
FLT	72A*s*	DIMM	DIMM *s* checksum	DIMM in slot *s* failed SPD checksum and will not be used.
FLT	72C*s*	DIMM	DIMM *s* mismatch	DIMM in slot *s* didn't match the other in pair. (J7xxx only--DIMMs must be in matched pairs.)
FLT	72D*s*	DIMM	DIMM *s* load err	Memory DIMMs are not in the proper order. As a result, the system cannot access DIMM *s* and has deallocated it.
INI	7300	SYS BD	mem config start	Starting main memory configuration.
TST	7301	SYS BD	check mem config	Checking for memory configuration change since last boot.
WRN	7302	SYS BD	mem confg changd	Memory physical configuration changed since last boot.
INI	7303	SYS BD	use confg change	Memory physical configuration didn't use saved configuration change. Use stored configuration data.
INI	7304	SYS BD	build mem intrlv	Building memory configuration with all DIMMs interleaved.
INI	7305	SYS BD	save mem config	Saving memory configuration information in non-volatile memory.
WRN	7306	SYS BD	use alt mem conf	Memory will be configured from fixed values, instead of detected DIMMs.
INI	7307	SYS BD	interleve memory	Generating the memory interleave.
FLT	7308	SYS BD	PDT is disabled	Firmware detected bad memory pages, but the Page Deallocation Table is disabled.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
FLT	7309	DIMM	insufficient mem	Insufficient error-free memory to continue.
FLT	730C	SYS BD	mem intrlv fail	Memory interleave generation failed.
INI	730F	SYS BD	mem config done	Main memory configuration complete.
TST	7400	DIMM	non-dest mem tst	Starting non-destructive memory test.
TST	740F	DIMM	non-dst tst done	Non-destructive memory test complete.
INI	7500	SYS BD	memory reset	Resetting memory system.
WRN	7501	SYS BD	mem log clr warn	Memory error logs didn't clear on first try.
FLT	7502	SYS BD	mem err log fail	Firmware could not clear memory error logs.
TST	7600	DIMM	dest mem test	Starting the destructive memory test.
WRN	7601	DIMM	mem init only	Skip the test, just initialize memory to save time.
TST	7602	DIMM	tst 1st mem page	Starting 3-pass test of first memory page.
TST	7603	DIMM	tst rest of mem	Starting 3-pass test of the rest of memory.
TST	7604	DIMM	start 1st pass	Starting 1st pass of memory test (write pseudorandom sequence).
TST	7605	DIMM	1st pass *x%*	First pass is *x*% complete.
TST	7606	DIMM	start 2nd pass	Starting 2nd pass of memory test (verify pseudorandom sequence, write inverse).
TST	7607	DIMM	2nd pass *x%*	Second pass is *x*% complete.
TST	7608	DIMM	start 3rd pass	Starting 3rd pass of memory test (verify inverse sequence).
TST	7609	DIMM	3rd pass *x%*	Third pass is *x*% complete.
TST	760A	DIMM	start mem init	Starting memory initialization. (Initialize to zero to set ECC.)
TST	760B	DIMM	mem init *x%*	Memory initialization is *x*% complete.
WRN	760C	DIMM	repeat dest test	Re-execute destructive test for hardware troubleshooting.
FLT	760D	DIMM	mem code cpy err	Firmware tried to copy code from ROM to memory, but the copy didn't match the original.
FLT	7610	DIMM	ECC wrt/read err	Writing and reading back good data caused memory ECC error.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
FLT	7611	DIMM	ECC single data	Memory ECC test failed to detect single-bit data error.
FLT	7612	DIMM	ECC single ECC	Memory ECC test failed to detect single-bit ECC error.
FLT	7613	DIMM	ECC multipl data	Memory ECC test failed to detect multiple-bit data error.
FLT	7614	DIMM	ECC multpl signl	Memory ECC test failed to signal multiple-bit error.
FLT	7800	SYS BD	mem err summary	Printing memory error summary word to RS-232.
FLT	7801	SYS BD	bus ctrl par err	System bus (Runway) control parity error detected.
FLT	7802	SYS BD	bus addr par err	System bus (Runway) address parity error detected.
FLT	7803	SYS BD	bus data par err	System bus (Runway) data parity error detected.
FLT	7804	SYS BD	mem out of range	Memory access outside configured memory space.
FLT	7805	SYS BD	bus broadcst err	System bus (Runway) broadcast error detected.
FLT	7806	SYS BD	mem addr par err	Memory bus address parity error detected.
FLT	7807	SYS BD	mem ctlr stat wd	Printing memory controller status word to RS-232.
FLT	781*s*	DIMM	DIMM *s* uncor err	Uncorrectable ECC error detected in DIMM s.
FLT	782*s*	DIMM	DIMM *s* corr err	DIMM *s* is bad and needs replacing.
FLT	783*s*	DIMM	Replace DIMM *s*	Correctable ECC error detected in DIMM *s*.
FLT	7840	SYS BD	unexpected HPMC	Unexpected HPMC detected.
FLT	7841	SYS BD	mem status invld	Memory error status word is invalid.
FLT	7842	SYS BD	mem summ invalid	Memory summary word is invalid.
FLT	7843	SYS BD	fwd prog invalid	Memory forward progress word is invalid.
FLT	7844	SYS BD	mem HPMC summ wd	Printing memory error summary word to RS-232.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
FLT	7845	SYS BD	mem ctlr stat wd	Printing memory controller status word to RS-232.
FLT	7846	SYS BD	mem err overflow	Multiple memory errors detected.
FLT	7848	SYS BD	addr not mapped	Memory address outside configured memory space.
FLT	785*s*	DIMM	MBE in DIMM *s*	Destructive memory test detected an uncorrectable memory error in DIMM *s*.
FLT	786*s*	DIMM	SBE&MBE DIMM *s*	Destructive memory test detected both an uncorrectable and a correctable memory error in DIMM *s*.
FLT	787*s*	DIMM	mem err DIMM *s*	Destructive memory test detected a pattern compare error in DIMM *s*.
FLT	788*s*	DIMM	SBE in DIMM *s*	Destructive memory test detected a correctable memory error in DIMM *s*.
FLT	7890	DIMM	MBE overwrt SBE	Firmware replaced a correctable memory error entry in the PDT with an uncorrectable memory error entry at the same address.
FLT	7891	DIMM	dup entry in PDT	The PDT already contains an entry at that address.
FLT	7892	SYS BD	PDT write error	Error adding the entry to the PDT.
FLT	7893	SYS BD	PDT is full	The PDT is full--cannot add new entry.
FLT	7900	SYS BD	no DMT entry	Internal error--cannot find DIMM entry.
FLT	7901	SYS BD	no rank entry	Internal error--cannot find rank entry.
FLT	7902	SYS BD	bad refrsh intvl	Computed refresh interval is invalid.
FLT	7903	SYS BD	mem intrlv fail	Cannot generate memory interleave.
FLT	7904	SYS BD	mem reloc failed	Cannot interleave with relocated range (3.75GB - 4.0GB).
FLT	7905	SYS BD	mem intrlv error	Undefined memory interleave failure.
FLT	79FF	SYS BD	mem firmware err	Internal error--never expected this to happen.
WRN	80F3	SYS BD	err rd IODC byte	Cannot read IODC from ROM or card.
WRN	80F4	EXT IO	boot read error	Cannot load IODC entry_init for boot device.
WRN	80F5	EXT IO	boot exec error	Error initializing boot device.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
WRN	80F6	EXT IO	boot read error	Cannot load IODC entry_io for boot device.
WRN	80F7	EXT IO	boot IO error	Error detected during boot device I/O.
WRN	80F8	EXT IO	invalid boot dev	Invalid boot device class; bad IODC?
WRN	80FC	EXT IO	invalid boot dev	Unexpected error; bad IODC?
INI	8800	IOCARD	PCI BusWlk start	Starting PCI bus and device discovery.
INI	88*r*1	IOCARD	PCI Rope *r* walk	Starting PCI bus and device discovery on Rope *r*.
INI	8802	IOCARD	PCI BusWalk done	PCI bus and device discovery complete.
INI	8803	SYS BD	PCI alloc done	Done allocating address space for PCI devices.
INI	8804	SYS BD	PCI config done	Done configuring PCI devices.
FLT	881*r*	IO BD	R2PCI*r* not found	Rope-to-PCI bridge *r* not found.
WRN	882*r*	IO BD	R2PCI*r* not found	Rope-to-PCI bridge r initialization failed.
FLT	883*r*	IO BD	Rope*r* config err	Rope *r* configuration failed.
INI	884*r*	EXT IO	Rope*r* debug tggl	Rope *r* debug register toggled.
FLT	884*r*	EXT IO	Rope*r* tgl fail	Rope *r* debug register toggle failed.
INI	8850	SYS BD	early rope0 init	Initializing rope 0 for early RS-232 output.
FLT	8850	SYS BD	rope0 init fail	Couldn't initialize rope 0.
INI	8860	SYS BD	rope0 init done	Rope 0 initialization complete.
INI	8870	IO BD	early R2PCI init	Initializing Rope-to-PCI bridge 0 for early RS-232 output.
FLT	8870	IO BD	R2PCI init fail	Couldn't initialize Rope-to-PCI bridge 0.
INI	8880	IO BD	R2PCI init done	Rope-to-PCI bridge 0 initialization complete.
INI	8890	IO BD	early Super init	Initializing Super-I/O for early RS-232 output.
FLT	8890	IO BD	Super init fail	Couldn't initialize Super-I/O.
INI	88A0	IO BD	Super init done	Super-I/O initialization complete.
WRN	8A03	EXT IO	No graph console	Cannot re-establish communications with the graphics console.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
WRN	8A04	EXT IO	No USB keyboard	Cannot re-establish communications with the USB keyboard.
TST	8C06	EXT IO	PCI BIST test	Running PCI Built-In Self-Test
WRN	8C07	EXT IO	PCI BIST error	PCI Built-In Self-Test failed.
WRN	8C08	SYS BD	PCI alloc error	PCI address space allocation failed.
WRN	8C09	IO BD	PCI mem mngr err	Memory allocation for PCI device failed.
WRN	8C0A	EXT IO	PCI mem type err	PCI device requested invalid memory type.
WRN	8C0B	IO BD	PCI max bus dpth	PCI bus depth exceeded maximum supported depth.
WRN	8C0C	EXT IO	PCI dev not cnfg	Unable to configure PCI device.
WRN	8C0F	IO BD	dev tree ovrflow	Data space for PCI devices is full.
WRN	8DEC	IO BD	init LAN SROM	Initializing the core LAN serial EPROM.
SHU	8DEC	IO BD	resetting system	Restarting system after core LAN initialization.
FLT	8E10	IO BD	PARALEL port cfg	Parallel port configuration failed.
FLT	8E11	IO BD	SERIAL1 port cfg	Serial 1 port configuration failed.
FLT	8E12	IO BD	SERIAL2 port cfg	Serial 2 port configuration failed.
FLT	8E13	IO BD	FLOPPY drive cfg	Floppy drive configuration failed.
FLT	8E20	IO BD	bad USB port cfg	USB port configuration failed.
WRN	9001	EXT IO	no console found	Search for console display device failed.
INI	9151	IO BD	init SERIAL_1	Initializing serial 1 port as console display.
INI	9152	IO BD	init SERIAL_2	Initializing serial 2 port as console display.
INI	915F	IO BD	init unknown dev	Initializing unknown device as console display.
INI	916*s*	EXT IO	init PCI slot *s*	Initializing PCI device in slot *s* as console display.
INI	91DB	IO BD	init SERIAL_LDB	Initializing serial LDB port as console display.
INI	9C51	IO BD	consol is SER_1	Console display is on serial port 1.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
WRN	9C51	IO BD	bad init SERIAL1	Serial port 1 failed to initialize as a console device.
INI	9C52	IO BD	consol is SER_2	Console display is on serial port 2.
INI	9160	EXT IO	builtin GRAPHICS	Initializing built-in graphics as console display.
INI	9C52	IO BRD	consol is SER_2	Console display is on serial port 2.
WRN	9C52	IO BD	bad init SERIAL2	Serial port 2 failed to initialize as a console device.
INI	9C6*s*	EXT IO	consol is GRAPH*s*	Console display is on graphics card in PCI slot *s*.
WRN	9C6*s*	EXT IO	bad PCI slot *s*	Graphics in PCI slot *s* failed to initialize as a console device.
INI	9C8*t*	EXT IO	cnfg mon type *t*	Set graphics console to monitor type *t*. (Seen when cycling through types.)
WRN	9C8*t*	EXT IO	mon type *t* fail	Failed to configure console to monitor type *t*.
INI	9CDB	IO BD	consl is SER_LDB	Console display is on serial LDB port.
WRN	9CDB	IO BD	bad init SER_LDB	Serial LDB port failed to initialize as a console device.
FLT	A088	IO BD	consl path fault	Unable to boot--no console device found.
WRN	A008	EXT IO	no boot device	Unable to boot--no bootable device found.
WRN	A0BD	EXT IO	device not ready	Boot device not ready--operation may be retried.
FLT	A0FF	EXT IO	unknown launch	Unable to boot. Explanation may appear on console.
WRN	A50F	EXT IO	init pri pth err	Unable to boot from primary boot device.
WRN	A70F	EXT IO	init otr pth err	Unable to boot from non-primary boot device.
INI	C10*m*	SYS BD	CPU*m* is monarch	CPU *m* was chosen as the monarch processor. (All other CPUs are slaves.)
INI	C30*m*	SYS BD	monarch*m* test	CPU *m* finished the monarch-only tests and system initialization.
INI	C30C	SYS BD	mnrch slv chck	The monarch CPU is checking whether the slaves are in the correct rendezvous.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
INI	C3FF	SYS/IO	late monarch tst	The monarch CPU is starting the late (post-memory) monarch-only tests.
FLT	C3FF	SYS/IO	late monarch flt	The late (post-memory) monarch-only tests failed.
INI	C4CC	SYS BD	initialize ccp	Searching for (lab-only) debugger card.
INI	C4CD	SYS BD	no ccp found	Debugger card not found.
INI	C4CE	SYS BD	ccp disabled	Debugger card disabled.
INI	C4CF	SYS BD	ccp found	Debugger card found.
INI	C500	SYS BD	get primary path	Autoboot is reading primary boot path from stable store.
INI	C540	EXT IO	init pri path	Autoboot is trying to boot from primary boot device.
INI	C580	EXT IO	load IPL pri pth	Loading IPL from primary boot device.
WRN	C5F0	EXT IO	err read pri IPL	Error loading IPL from primary boot device.
FLT	C5F0	EXT IO	pri IPL fault	Error loading IPL from primary boot device.
WRN	C5F1	EXT IO	err read pri IPL	Cannot load IPL from primary boot device--load address invalid.
WRN	C5F2	EXT IO	err read pri IPL	Cannot load IPL from primary boot device--file is not IPL image.
WRN	C5F3	EXT IO	err read pri IPL	Cannot load IPL from primary boot device--IPL image size invalid.
WRN	C5F4	EXT IO	err read pri IPL	Cannot load IPL from primary boot device--IPL entry point address invalid.
WRN	C5F8	EXT IO	err read pri IPL	Cannot load IPL from primary boot device--IPL image checksum failed.
INI	C5FF	<blank>	launch pri IPL	Booting from primary boot path.
INI	C642	EXT IO	init kybrd consl	Try to initialize USB keyboard.
FLT	C642	EXT IO	keyboard error	An error was detected trying to access the keyboard.
WRN	C643	EXT IO	keyboard reinit	Keyboard was re-initialized.
WRN	C64F	EXT IO	reset montr type	The console device failed to initialize with the given monitor type. Try again with type 1.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
TST	C680	SYS BD	builtin graphics	Look for built-in graphics card.
TST	C68*s*	SYS BD	test graph in *s*	Look for graphics card in PCI slot *s*.
INI	C68*s*	SYS BD	init graph in s	Successfully initialized graphics card in PCI slot *s*.
INI	C68*0*	SYS BD	bultin graphics	Successfully initialized built-in graphics card.
WRN	C68*0*	SYS BD	bultin graphics	built-in graphics initialization failed.
WRN	C68*s*	SYS BD	fail graph in *s*	Card in PCI slot *s* failed graphics initialization or is not a graphics card.
INI	C740	EXT IO	init other path	Autoboot is trying to boot from non-primary boot device.
INI	C780	EXT IO	ld IPL othr path	Loading IPL from non-primary boot device.
WRN	C7F0	EXT IO	other IPL fault	Error loading IPL from non-primary boot device.
WRN	C7F1	EXT IO	bad alt IPL read	Cannot load IPL from non-primary boot device--load address invalid.
WRN	C7F2	EXT IO	bad alt IPL read	Cannot load IPL from non-primary boot device--file is not IPL image.
WRN	C7F3	EXT IO	bad alt IPL read	Cannot load IPL from non-primary boot device--IPL image size invalid.
WRN	C7F4	EXT IO	bad alt IPL read	Cannot load IPL from non-primary boot device--IPL entry point address invalid.
WRN	C7F8	EXT IO	bad alt IPL read	Cannot load IPL from non-primary boot device--IPL image checksum failed.
WRN	C7FF	<blank>	launch IPL other	Booting from a device other than the primary boot path.
INI	CB00	SYS BD	TOC initiated	A Transfer of Control entered the firmware TOC handler.
WRN	CB01	SYS BD	no OS TOC vector	There is no TOC vector for the operating system. Firmware will soft boot the system.
WRN	CB02	SYS BD	bad OS TOC addr	The operating system TOC handler vector is invalid. Firmware will soft boot the system.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
WRN	CB03	SYS BD	bad OS TOC code	The operating system TOC handler is invalid. Firmware will soft boot the system.
WRN	CB04	SYS BD	bad OS TOC len	The size of the operating system TOC handler is invalid. Firmware will soft boot the system.
WRN	CB05	SYS BD	bad OS TOC chksm	The operating system TOC handler failed the checksum test. Firmware will soft boot the system.
WRN	CB0A	SYS BD	prev TOC logged	Firmware detected unread PIM data from a previous TOC and will not overwrite it. (PIM for this TOC is lost.)
INI	CB0B	SYS BD	branch to OS TOC	Branching to the operating system TOC handler.
WRN	CB0C	SYS BD	br OS TOC failed	Branch to the operating system TOC handler failed. Firmware will soft boot the system.
WRN	CB10	SYS BD	LPMC initiated	A Low-Priority Machine Check entered the firmware LPMC handler. The handler should log the error and return to normal operation.
WRN	CB11	SYS BD	icache LPMC err	An instruction cache parity error caused the LPMC.
WRN	CB12	SYS BD	dcache LPMC err	A data cache parity/ECC error caused the LPMC.
WRN	CB13	SYS BD	dcache tag error	The parity error is in the tag portion of the data cache.
WRN	CB14	SYS BD	dcache data err	The parity error is in the data portion of the data cache.
FLT	CB1F	SYS BD	OS LPMC failed	Firmware couldn't branch to the operating system LPMC handler. It will halt the CPU, requiring a power cycle to recover.
WRN	CB71	SYS BD	HPMC occurred	A High-Priority Machine Check caused entry to PDCE_CHECK (the firmware trap handler).
WRN	CB72	SYS BD	LPMC occurred	A Low-Priority Machine Check caused entry to PDCE_CHECK (the firmware trap handler).

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
WRN	CB73	SYS BD	TOC occurred	A Transfer of Control caused entry to PDCE_CHECK (the firmware trap handler).
FLT	CB9*r*	IO BD	Error on rope*r*	An error was detected on rope *r*.
FLT	CB99	SYS BD	seed IVA handler	PDC_SEED_ERROR triggered an HPMC.
FLT	CB9A	SYS BD	HPMC overwrite	Firmware is overwriting PIM data from a previous HPMC.
OFF	CBA1	SYS BD	AIOC int dat err	I/O controller internal error.
OFF	CBA2	IO BD	EtoA rope perr	Parity error between I/O controller and Rope-to-PCI bridge.
OFF	CBA3	SYS BD	access invld TLB	An invalid I/O TLB entry was accessed.
OFF	CBA4	IO BD	EtoA rp cmd perr	Command parity error between I/O controller and Rope-to-PCI bridge.
OFF	CBA5	IO BD	CDF timeout	Rope Command/Data FIFO is backed up.
OFF	CBA6	IO BD	R2PCI resp tmout	Rope-to-PCI bridge timed out. Could be a failure of the PCI card, rope, or R2PCI bridge.
OFF	CBA7	IO BD	Unknown AIOC err	Unknown I/O controller error.
OFF	CBB1	IO BD	PCI timeout	A PCI card requested the bus but failed to use it.
OFF	CBB2	IO BD	PCI timeout; OV	More than once aPCI card requested the bus but failed to use it.
OFF	CBB3	IO BD	R2PCI intrnl err	Rope-to-PCI bridge internal error.
OFF	CBB4	IO BD	R2PCI int err;OV	Multiple Rope-to-PCI bridge internal errors.
OFF	CBB6	IO BD	PCI data req err	PCI bus data requestor error: R2PCI detected PERR# assertion.
OFF	CBB8	IO BD	PCI D req err;OV	Rope-to-PCI bridge detected multiple PERR# assertions.
OFF	CBBA	IO BD	PCI data par err	PCI bus data parity error.
OFF	CBBC	IO BD	PCI Dpar err;OV	Multiple PCI bus data parity errors.
OFF	CBBE	IO BD	R2PCI intrnl err	Error in R2PCI internal data to PCI bus.
OFF	CBC0	IO BD	R2PCI int err;OV	Multiple R2PCI internal data to PCI bus errors.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
OFF	CBC2	IO BD	PCI data parity	PCI data parity error. I/O error log word 3 contains the error address.
OFF	CBC4	IO BD	PCI data par; OV	Multiple PCI data parity errors. I/O error log word 3 contains the error address.
OFF	CBC6	IO BD	R2PCI intrnl err	Rope-to-PCI bridge internal data error: R2PCI detected PERR# assertion.
OFF	CBC8	IO BD	R2PCI int err;OV	Multiple R2PCI internal data errors: R2PCI detected multiple PERR# assertions.
OFF	CBCA	IO BD	PCI data rs err	PCI bus data responder error: R2PCI detected PERR# assertion.
OFF	CBCC	IO BD	PCI D rs err; OV	Multiple PCI bus data responder errors: R2PCI detected multiple PERR# assertions.
OFF	CBCE	IO BD	R2PCI T-Abort	Rope-to-PCI bridge signalled Target Abort.
OFF	CBD0	IO BD	R2PCI T-Abort;OV	Rope-to-PCI bridge signalled multiple Target Aborts.
OFF	CBD2	IO BD	PCI parity err	PCI address/command parity error.
OFF	CBD4	IO BD	PCI par err; OV	Multiple PCI address/command parity errors.
OFF	CBD6	IO BD	PCI no DEVSEL#	No PCI device selected (DEVSEL# assertion). I/O error log word 3 contains the error address.
OFF	CBD8	IO BD	PCI no DEVSEL;OV	Multiple DEVSEL# assertions. I/O error log word 3 contains the error address.
OFF	CBDA	IO BD	PCI target abort	A PCI device signalled Target Abort. I/O error log word 3 contains the error address.
OFF	CBDC	IO BD	PCI T-Abort; OV	A PCI device signalled multiple Target Aborts. I/O error log word 3 contains the error address.
OFF	CBDD	IO BD	PCI assrts LOCK#	A PCI device asserted LOCK#.
OFF	CBDE	IO BD	PCI LOCK#; OV	A PCI device asserted LOCK# multiple times.
OFF	CBE0	IO BD	PCI assrts SERR#	A PCI device asserted SERR#: address parity error or other system error.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
OFF	CBE2	IO BD	PCI SERR#; OV	A PCI device asserted SERR# multiple times.
OFF	CBE3	IO BD	Unknown PCI err	Unknown PCI error detected.
OFF	CBE6	SYS BD	AtoE rope perr	Parity error between system I/O controller and Rope-to-PCI bridge.
OFF	CBE7	IO BD	R2PCI intrnl err	Rope-to-PCI bridge internal data error.
OFF	CBE8	SYS BD	AtoE rope perr	Command parity error between system I/O controller and Rope-to-PCI bridge.
OFF	CBE9	IO BD	Unknown Rope err	Unknown rope error occurred.
FLT	CBF0	SYS BD	HPMC initiated	A High-Priority Machine Check entered the firmware HPMC handler.
FLT	CBF1	SYS BD	no OS HPMC IVA	There is no HPMC vector for the operating system. Firmware will halt the CPU, requiring a power cycle to recover.
FLT	CBF2	SYS BD	bad OS HPMC len	The size of the operating system HPMC handler is invalid. Firmware will halt the CPU, requiring a power cycle to recover.
FLT	CBF3	SYS BD	bad OS HPMC addr	The operating system HPMC handler vector is invalid. Firmware will halt the CPU, requiring a power cycle to recover.
FLT	CBF4	SYS BD	bad OS HPMC cksm	The operating system HPMC handler failed the checksum test. Firmware will halt the CPU, requiring a power cycle to recover.
FLT	CBF5	SYS BD	OS HPMC vector 0	The size of the operating system HPMC handler is zero. Firmware will halt the CPU, requiring a power cycle to recover.
WRN	CBFA	SYS BD	prev HPMC logged	Firmware detected unread PIM data from a previous HPMC and will overwrite it.
FLT	CBFB	SYS BD	brnch to OS HPMC	Branching to the operating system HPMC handler.
FLT	CBFC	SYS BD	OS HPMC br err	Branch to the operating system HPMC handler failed. Firmware will halt the CPU, requiring a power cycle to recover.
FLT	CBFD	SYS BD	unknown check	The firmware trap handler didn't detect an HPMC, LPMC, or TOC.
FLT	CBFE	SYS BD	HPMC during TOC	A High-Priority Machine Check occurred during Transfer of Control processing.

Table 3-1. Chassis Codes for J6700 Workstations

Ostat	Code	FRU	Message	Description
FLT	CBFF	SYS BD	multiple HPMCs	A High-Priority Machine Check occurred while processing another HPMC.
INI	CC0*n*	SYS BD	CPU*n* OS rendezvs	Slave CPU *n* entering the final rendezvous, waiting for the operating system to awaken it.
INI	CC1*n*	SYS BD	CPU*n* early rend	Slave CPU *n* entering the early rendezvous, waiting for the monarch CPU to initialize scratch RAM and other system state.
INI	CC2*n*	SYS BD	CPU*n* rendezvous	Slave CPU *n* entering rendezvous. Slave CPUs enter this rendezvous numerous times during boot.
INI	CC3*n*	SYS BD	CPU*n* cache rend	Slave CPU *n* entering cached rendezvous, waiting for the monarch CPU to configure the system bus.
INI	CC4*n*	SYS BD	CPU*n* mem rendez	Slave CPU *n* entering memory rendezvous, waiting for the monarch CPU to select a boot device.
TST	D000	SYS BD	micro controller	Firmware is initializing communications with the system controller.
WRN	D004	SYS BD	micro not resp	Firmware detected a communications error with the system controller.
INI	D005	SYS BD	set dom1 fan spd	Firmware is initializing communications with the system controller.
INI	D006	SYS BD	set dom2 fan spd	Firmware is initializing communications with the system controller.
WRN	D007	SYS BD	bad microctl cmd	Firmware detected a communications error with the system controller.
FLT	D01*n*	SYS/IO	fan *n*: failure!	Firmware detected system fan *n* stopped.
WRN	D02*n*	SYS/IO	fan *n*: too slow!	Firmware detected system fan *n* is running too slowly.

Running System Verification Tests

HP-UX uses an online diagnostics product called the Support Tools Manager that allows system operation verification.

Three interfaces are available with the Support Tools Manager: a command line interface (accessed through the `cstm` command), a menu-driven interface (accessed through the `mstm` command), and the graphical user interface (accessed through the `xstm` command).

For more information on these user interfaces, see the online man pages by entering the following at a command line prompt:

```
man cstm [Enter]

man mstm [Enter]

man xstm [Enter]
```

For information on the enhanced online diagnostics, see the *Support Media User's Manual* (HP Part Number B3782-90176).

To access the Support Tools Manager, perform the following steps:

1. In a terminal window, type the following at the # prompt to invoke the command line interface:

   ```
   # cstm [Enter]
   ```

2. The following message appears:

   ```
   Support Tool Manager        Version A.01.00
   Type 'help' for a list of available commands.
   CSTM>
   ```

3. To verify the system operation, type the following at the `CSTM>` prompt:

   ```
   CSTM> verify all [Enter]
   ```

   Messages similar to the following appear:

   ```
   Verification has started on device (CPU).
   Verification has started on device (FPU).

   CSTM> Verification of (FPU) has completed.
   CSTM> Verification of (CPU) has completed.
   ```

4. Press `[Enter]` to return to the `CSTM>` prompt after all test results are reported.
5. To exit the Support Tools Manager, enter the following:

   ```
   CSTM> exit [Enter]
   ```

If any tests failed, run Selftest and ISL diagnostics to isolate the problem.

Running ODE-Based Diagnostics

The Offline Diagnostic Environment (ODE) consists of diagnostic modules for testing and verifying system operation. ODE provides all the necessary functions for the user to load specified tests and interact with those tests.

ODE is an ISL utility. To boot ODE:

1. Invoke the ISL environment from the system disk or a CD ROM.
2. Type `ode [Enter]` after the `ISL>` prompt to invoke ODE from the LIF directory on the system disk. The prompt changes to `ODE>`.

Not all of the test modules are available on all systems. To see what test modules are available to run on this system, type `ls` at the `ODE>` prompt. The available modules include the following:

- `astrodiag` – tests and verifies the basic functionality of the Astro memory controller/I/O chip.
- `siodiag` – tests and verifies the basic functionality of the SuperI/O multifunction I/O chip, including serial, parallel, USB, and so forth.
- `wdiag` – tests and verifies the functionality of the PA-RISC chip.
- `memtest` – tests and verifies the memory arrays. If an error is detected, the diagnostic reports the memory card and its slot number that needs replacement. It also provides a map of the memory configuration so that the user can identify the type of memory and its slot location.
- `fupdate` – updates the system's Processor Dependent Code (PDC) firmware in the EEPROM.
- `mapper` – identifies the configuration of HPPA systems. It displays path, identification, and revision information of I/O components, configuration of memory controllers, processors, co-processors, cache, and TLB, as well as processor board component revisions and values of various HPPA system identifiers, revisions, and capabilities.

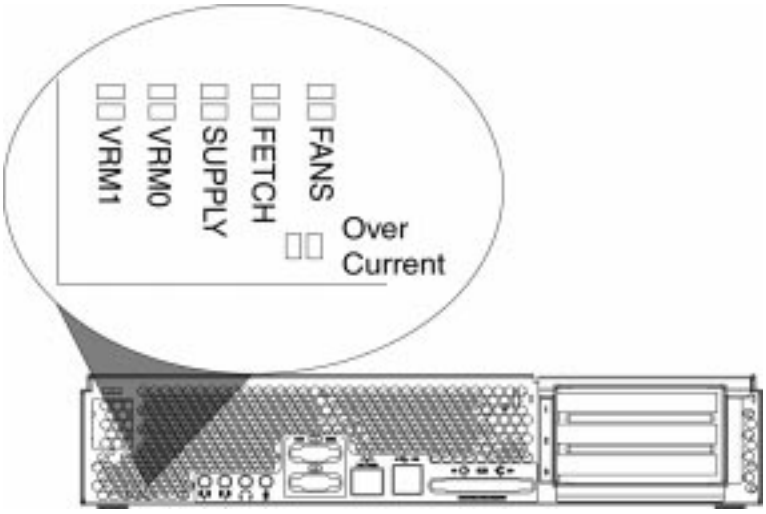
For further information on the various ODE commands and a complete listing of the command set, type `help [Enter]` at the `ODE>` prompt or at the prompt of one of the test modules.

Using the System Board LEDs for Troubleshooting

This section provides a description of the system board's Light Emitting Diodes (LEDs) and how to use them for troubleshooting. These LEDs are located inside of the workstation on the system board's left-back edge. See Figure 3-5.. Note that you will have to view these LEDs through the airflow holes on the back of your workstation.

NOTE The SUPPLY LED is not currently implemented. Therefore, it does not provide any troubleshooting information.

Figure 3-5. System Board LEDs



For those system problems that this section is not able to solve, you will have to call your local HP Support Representative. Before you call, record the state (on, off or blinking) of your LEDs and give this information to your local HP support representative. The representative will use this information to determine the course of action to take.

Interpreting the LED Information

Table 3-2. explains how to interpret the information the system board LEDs provide. Note that the SUPPLY LED is reserved for future functionality.

Table 3-2. Interpreting the System Board LEDs

LED Name	LED's Color When On	Description
VRM1	Green	This light, when on, indicates that the voltage regulator module is working correctly for processor one. The default state for this light is on.

Table 3-2. Interpreting the System Board LEDs

LED Name	LED's Color When On	Description
VRM0	Green	This light, when on, indicates that the voltage regulator module is working correctly for processor zero. The default state for this light is on.
FETCH	Green	This light, when on, indicates that one or both processors is fetching code. The default state for this light is on.
FANS	Yellow (blinking)	Note that the yellow light blinks a heart beat when the system is working correctly. See Table 3-3. for more details for interpreting the blinks of this light.
Over Current	Red	This light, when on, indicates there is a short somewhere in the system. The default state for this light is off.

There are six LED blink sequences supported by the System Controller. The LED blink sequences are shown in Table 3-3. Note that each blink of the LED represents a tenth of a second (0.1 sec.).

If the FANS LED is ever stuck either ON or OFF, a system problem has occurred. This system problem is most likely an I2C bus hang. A potential fix may be to check that the power supply cables are correctly plugged in. If this does not work, call you local HP Support Representative.

Table 3-3. Blink Sequences for the FANS LED

Blink Sequence Number	LED Blink Sequence (black dot represents 0.1 second LED on; white dot is 0.1 second LED is off)	Description
System Controller Non-error Blink Sequences		
1	●○●○○○○○○○	System controllers normal heart beat.
2	●●●●●○○○○○	This is a transient state shown by the system controller at power up.
3	●●●●●●●●●●○○○○○○○○○○	System controller's transient state. There is no system problem.

Table 3-3. Blink Sequences for the FANS LED

Blink Sequence Number	LED Blink Sequence (black dot represents 0.1 second LED on; white dot is 0.1 second LED is off)	Description
System Controller Error Blink Sequences		
4	● ❍ ❍ ❍ ❍ ❍ ❍ ❍ ❍ ❍	System controller shut off power to the system because the ambient temperature exceeded 60˚C or 140˚F.
5	● ● ● ● ● ● ● ● ● ❍	System controller detects a fan failure. If this happens you need to read the message in the LCD on the front of the workstation.
6	● ❍ ● ❍ ● ❍ ❍ ❍ ❍ ❍	System controller is reporting an error.

Troubleshooting with System Board LEDs

This section explains what to do when you see the LEDs on your system board in a non-default state, and when the yellow FANS LED displays certain blink sequences. For the default states, see Table 3-2. Note that the non-default state is a state that *should not* exist, and it is a state that requires a solution.

Table 3-4. Solutions for the Non-Default LED States

LED Name[1]	Non-Default State	Solution
VRM1	OFF	If the following solutions do not bring this LED back on, replace VRM1 board. • Swap VRM cards to determine if VRM1 is bad • Determine that the power cable to the system is plugged in • Check that the power button has been pressed on • Re-seat the VRM1 board in its connector • Check that the VRM1 connector cable is properly plugged in

Table 3-4. Solutions for the Non-Default LED States

LED Name[1]	Non-Default State	Solution
VRM0	OFF	If the following solutions do not bring this LED back on, replace VRM0 board. • Swap VRM cards to determine if VRM0 is bad • Determine that the power cable to the system is plugged in • Check that the power button has been pressed on • Re-seat the VRM0 board in its connector • Check that the VRM0 connector cable is properly plugged in
FETCH	OFF	If the following solutions do not bring this LED back on, replace the system board. • Look at the system's LCD to determine if the firmware update process has been interrupted • Determine that the power cable to the system is plugged in • Check that the power button has been pressed on • Determine that all external peripheral devices are turned on and that their cables are properly connected • Check that all internal devices are powered on and that their cables are properly connected

Table 3-4. Solutions for the Non-Default LED States

LED Name[1]	Non-Default State	Solution
FANS	OFF or blink sequence 4, 5 or 6	If the following solutions do not bring the LED back on or cause it to properly blink, replace the system board. OFF — Unplug the system and replace the system board Blink Sequence 4 — Unplug the system and operate the unit when its environment gets cooler Blink Sequence 5 — Replace the fan associated with the message in your system LCD. If power supply fans are bad, you have to replace the power supply. If the PCI fan is bad, replace it. If either one of the processor fans are bad, you must replace the system board. Note, fans may still be spinning, but their control signal may have failed. Blink Sequence 6 — Check that the 24-pin power supply signal cable is properly connected Press the power button off and unplug the system and wait for two minutes before turning the system back on
SHORT	ON	If the following solutions do not turn this LED off, replace the system board. • Check that no pieces of metal are shorting connections anywhere in the system • Check that no pins on system connectors are bent and touching each other

1. The LEDs are in the OFF state, or in the case of the FANS LED, the LED is blinking sequence 1, 2, or 6 or it is not blinking.

4 Field Replaceable Units (FRUs)

This chapter lists the Field Replaceable Units (FRUs) for the HP VISUALIZE J6700 workstations. This chapter then provides procedures for removing and replacing the FRUs in the workstations.

Chapter Overview

This chapter contains the following main sections:

- Tools Required
- Exchange and Nonexchange Part Numbers
- FRU Removal and Replacement
  - — Electrostatic Discharge (ESD) Precautions
  - — Prerequisite Steps for All Removal and Replacement Procedures
  - — Exploded View Diagram
  - — Front Bezel and Top Panel
  - — LCD Panel
  - — Hard Disk Drives
  - — Hard disk Drive Backplane
  - — CD ROM Drive
  - — Memory DIMMs
  - — Power Supply
  - — PCI Cage
  - — PCI Backplane
  - — Speaker
  - — System Board
  - — Real-Time Clock

WARNING **For most of the removal and replacement procedures in this chapter, you must power off the workstation and unplug the workstation power cord from the AC power outlet. The exceptions to this are the removal and replacement of DIMMs and the PCI cage. For these you only need to power off the workstation.**

NOTE To maintain FCC/EMI compliance, verify that all covers are replaced and that all screws are properly seated.

Tools Required

Use the following tools to remove or replace FRUs:

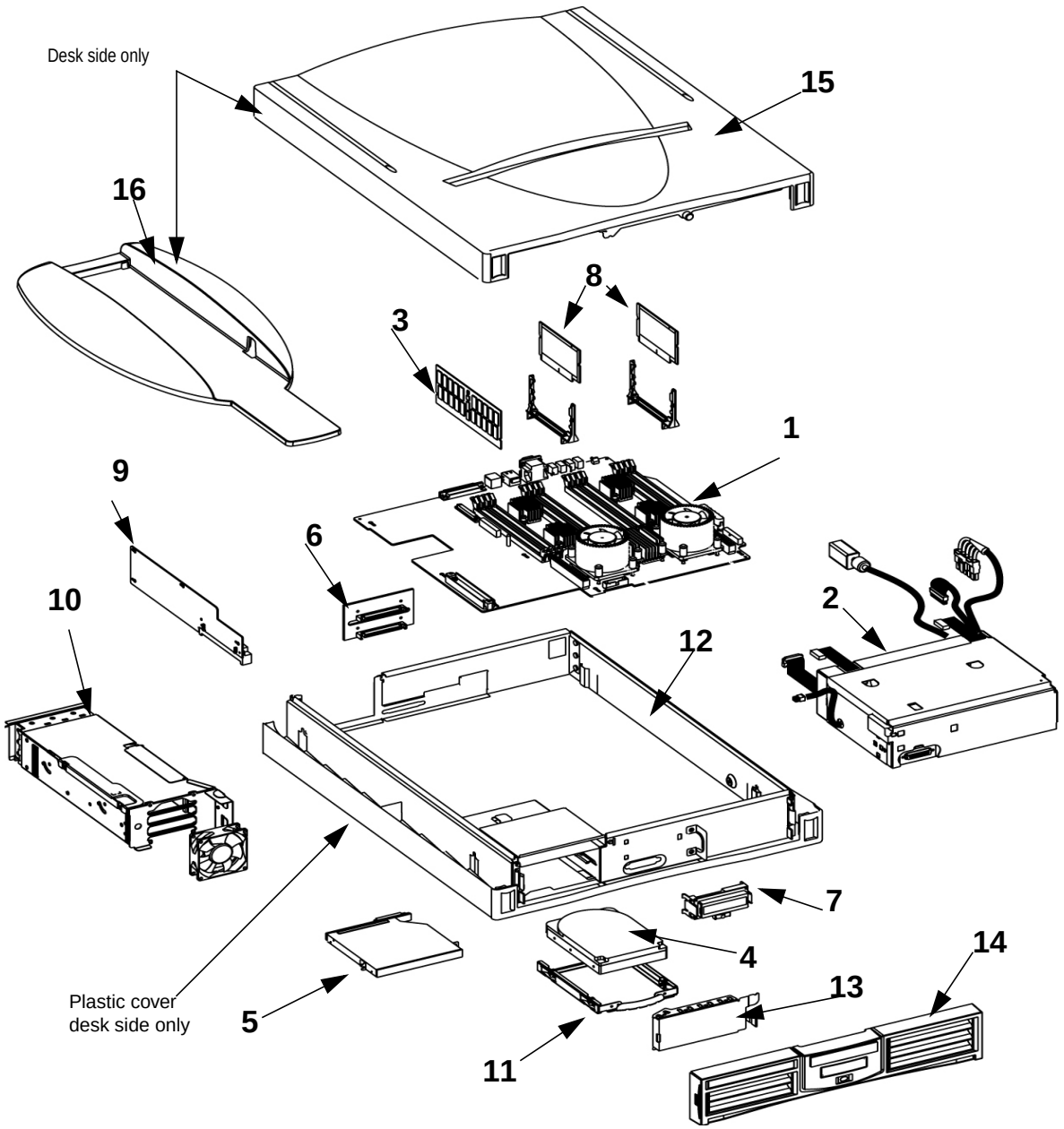
- Light-duty flat blade screwdriver with 6-inch (150 mm) blade
- T-15 Torx and T-20 (for rack mounting) Torx drivers
- ESD equipment (see the “Electrostatic Discharge (ESD) Precautions” section later in this chapter for detailed information)

Exploded View Diagram

Figure 4-1 shows an exploded view of the internal components (FRUs) in the J6700 workstations.

Refer to this figure to identify the various workstation FRUs while performing the FRU removal and replacement procedures in this chapter.

Figure 4-1. Exploded View of the J6700 Workstation



Exchange and Nonexchange Part Numbers

In this chapter we refer to *exchange* and *nonexchange* part numbers. You must return FRUs with exchange part numbers in exchange for replacement FRUs. Do *not* return FRUs with nonexchange part numbers – you may discard them.

The following Tables 4-1 lists the exchange part numbers for the J6700 workstation.

Table 4-1. J6700 Exchange Part Numbers

Numbers in Figure 4-1	Part Number	Description
1	A5990-69010	J6700 System Board Assembly
2	A5990-69001	Power supply 500W includes system speaker, power supply fans, and LCD display cable
3	A3863-69001	512 MB SDRAM DIMM
3	A3864-69001	1 GB SDRAM DIMM
4	A1658-69031	LVD Ultra SCSI hard disk 18 GB 10K RPM
4	A1658-69032	LVD Ultra SCSI hard disk 36 GB 10K RPM

The following Tables 4-2 lists the nonexchange part numbers for the J6700 workstation.

Table 4-2. J6700 Nonexchange Part Numbers

Numbers in Figure 4-1	Part Number	Description
5	A5990-62023	CD ROM slim-line, ATAPI Assembly
6	A5990-66530	PCA, SCA backplane (disk drive)
7	A5990-62015	LCD/power switch assembly
8	0950-4156	VRM assembly
9	A5990-66520	PCA-PCI backplane board
Not Shown	A1658-86004	Real Time Clock/Battery Module
10	A5990-62006	PCI cage assembly includes PCI tray fan
11	A5990-62003	Disk drive bracket assembly
Not Shown	1390-1266	Locking Thumbscrew
Not Shown	0515-2721	T15 Screw - M3x6 (Mounts CD ROM drive to chassis, system board mounting, PCI backplane mounting, and power supply mounting)
Not Shown	0380-2018	Jackscrew - 4 - 40Mx4F
Not Shown	0515-2332	M3 screws for mounting SCA board
12	A5990-62002	Main chassis assembly[1]
14	A5990-63003	Internal SCSI cable
13	A5990-62004	Disk EMI cover assembly
Not Shown	A5990-62005	Top cover assembly
14	A5990-62007	Front bezel assembly
Not Shown	A5990-63004	CD ROM IDE cable
Not Shown	A5990-40021	Trim - bezel bottom (with J6700 branding)
Not Shown	A5990-40002	Trim - bezel bottom (blank - no branding)
Not Shown	A5990-62002	J6700 Rack Mount Kit[2]
Not Shown	A5990-62020	Rack mounting hardware kit[2]
Not Shown	A5990-62021	Cable management assembly
Not Shown	A5990-40006	Front bezel end caps
Not Shown	A5990-40019	Right side cover (with logo)[3]
Not Shown	A5990-40020	Left side cover (with logo)[3]

Table 4-2. J6700 Nonexchange Part Numbers

Numbers in Figure 4-1	Part Number	Description
15	A5990-40010	Cosmetic cover (without logo)[3]
16	A5990-40009	Deskside pedestal[3]
Not Shown	A5990-00044	Drip pan[3]
Not Shown	A4983-60111	USB mouse, 3 buttons
Not Shown	A4983-60401	USB keyboard, U.S. English
Not Shown	A4983-60403	USB keyboard, German, Euro
Not Shown	A4983-60404	USB keyboard, Spanish, Euro
Not Shown	A4983-60405	USB keyboard, French, Euro
Not Shown	A4983-60406	USB keyboard, Kanji, JIS-109
Not Shown	A4983-60409	USB keyboard, Norwegian, Euro
Not Shown	A4983-60411	USB keyboard, Swiss-German, Euro
Not Shown	A4983-60412	USB keyboard, Swedish, Euro
Not Shown	A4983-60413	USB keyboard, U.K. English, Euro
Not Shown	A4983-60414	USB keyboard, Belgian/Flemish, Euro
Not Shown	A4983-60416	USB keyboard, Danish, Euro
Not Shown	A4983-60421	USB keyboard, Korean
Not Shown	A4983-60423	USB keyboard, Chinese/Trad

1. Order this for all sheet metal parts unless otherwise listed.
2. Used on rack mounted systems only.
3. Used on desk side mounted systems only.

FRU Removal and Replacement

The procedures in this section describe how to remove and replace J6700 workstation FRUs. Observe the electrostatic discharge (ESD) precautions and the prerequisites for removing and replacing FRUs in the next two subsections, as well as any NOTEs, CAUTIONs, and WARNINGs in each FRU removal and replacement procedure.

NOTE If you need to install a new FRU, simply follow the procedures for *replacing* the FRU in this chapter. (That is, replacement procedures are the same as those for installing new FRUs.)

Electrostatic Discharge (ESD) Precautions

To prevent damage to the J6700 workstation, observe all of the following ESD precautions while performing FRU removal and replacement procedures:

1. Remove all ESD-generating materials from the work area in which you will remove and replace a workstation's FRU(s).
2. Stand on an ESD (static-free) mat.
3. Wear a grounding wrist strap to ensure that any accumulated electrostatic charge discharges from your body to ground.
4. Connect all equipment together, including the ESD mat, grounding wrist strap, workstation, and peripherals.
5. Keep uninstalled printed circuit boards in their protective antistatic bags.
6. Once you have removed printed circuit boards from their protective antistatic bags, handle the printed circuit boards by their edges only.

Prerequisite Steps for All Removal and Replacement Procedures

You must complete the following steps before performing any of the FRU removal and replacement procedures in this chapter:

1. Power off the workstation (either by executing `shutdown -h` as `root`, or by simply pressing the power switch on the front panel of the workstation, which accomplishes the same thing), as well as the monitor and any attached peripheral devices.
2. Unplug the workstation power cord and all peripheral devices from AC power outlets.
3. Attach the static-grounding wrist strap by following the instructions on the package. Attach the sticky end of the wrist strap to bare metal on the rear panel of the workstation.

NOTE To make access to the internal FRUs easier, you may want to place the workstation on a table or workbench instead of leaving it on the floor.

CAUTION This workstation is designated for two-person lifting; it weighs approximately 36 to 49 pounds (12 to 22 kg), depending on the configuration. Do not attempt to lift it by yourself, or injury may result.

Front Bezel and Top Cover

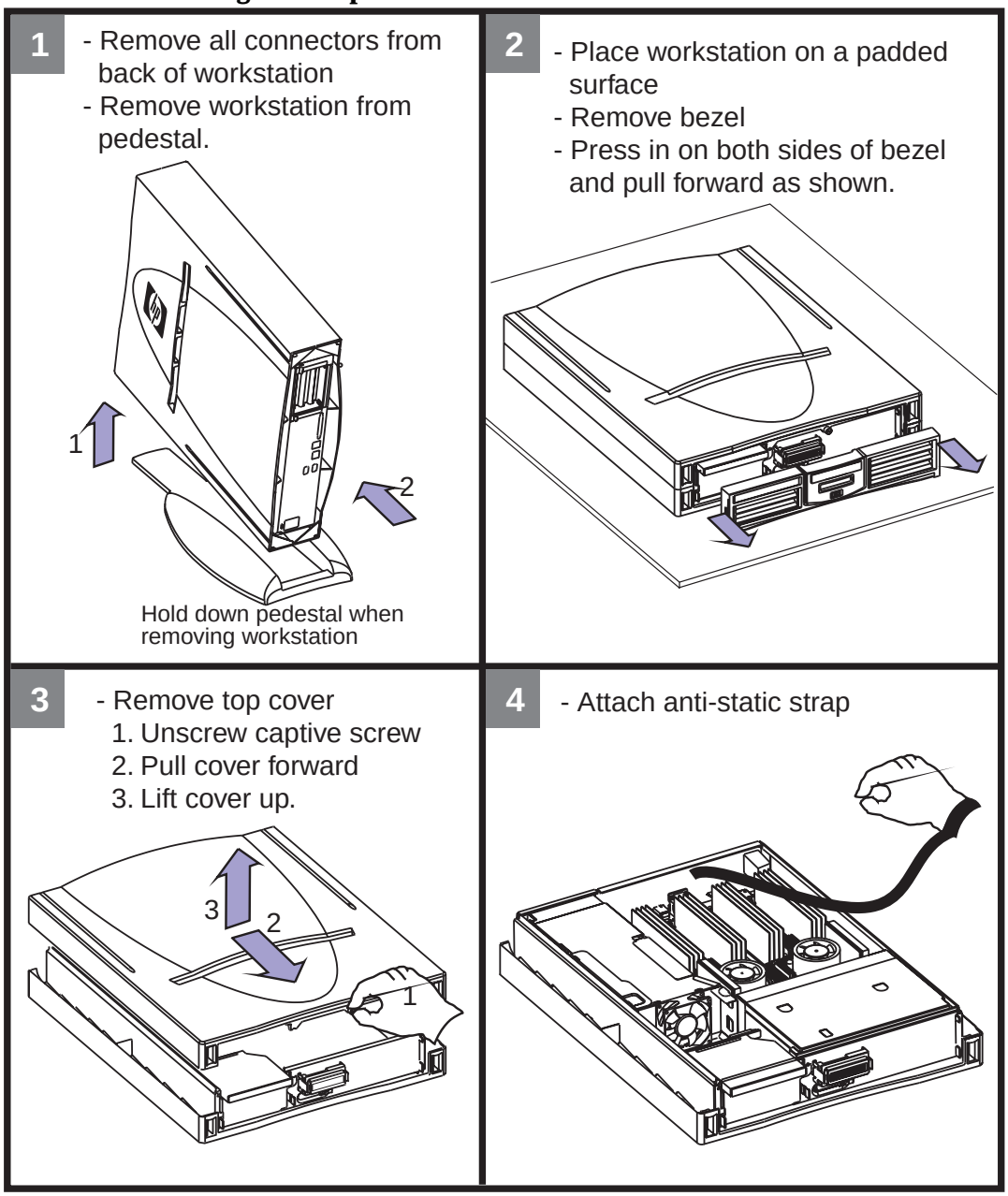
This section describes how to remove and replace the J6700 workstation's front bezel and top cover.

Note that you can perform certain operations, like removing and replacing hard disk drives, simply removing the front bezel of the workstation. Other operations require more access to the interior of the workstation, so you will need to remove the front bezel or top panel to perform those procedures.

CAUTION The system will not operate with the top panel removed.

Removing the Top Cover

Figure 4-2. Removing the Top Cover



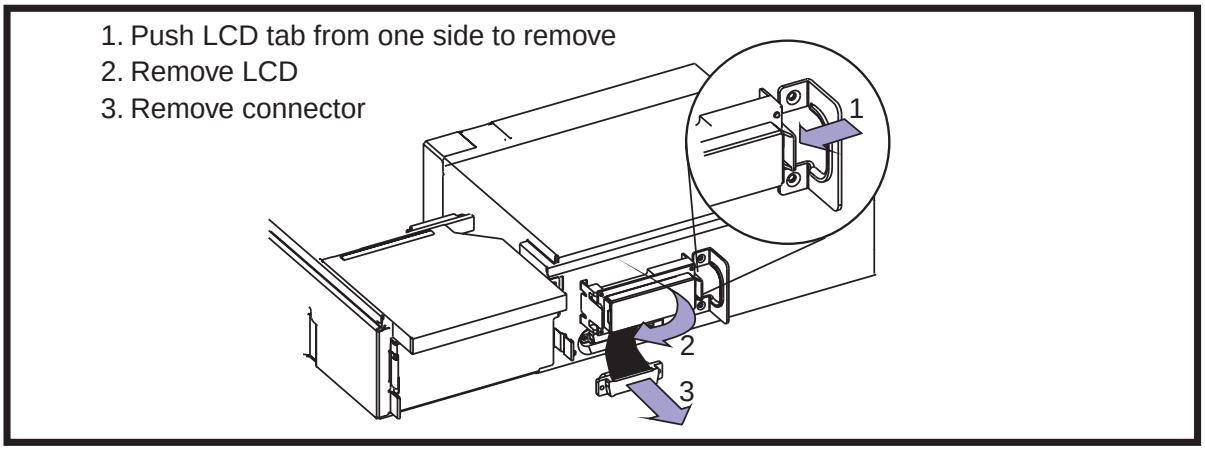
To replace the top cover or front bezel, perform the above steps in reverse.

NOTE The graphics in these steps depict a desk side unit. If this is a rack mount unit, the skins and pedestal will not be present. Rack mounted systems will not have air louvres mounted in the front bezel. When replacing the bezel, remove and discard the louvres from the new bezel unit.

Removing the LCD Panel

To remove the LCD panel, do the following:

Figure 4-3. Removing the LCD Panel

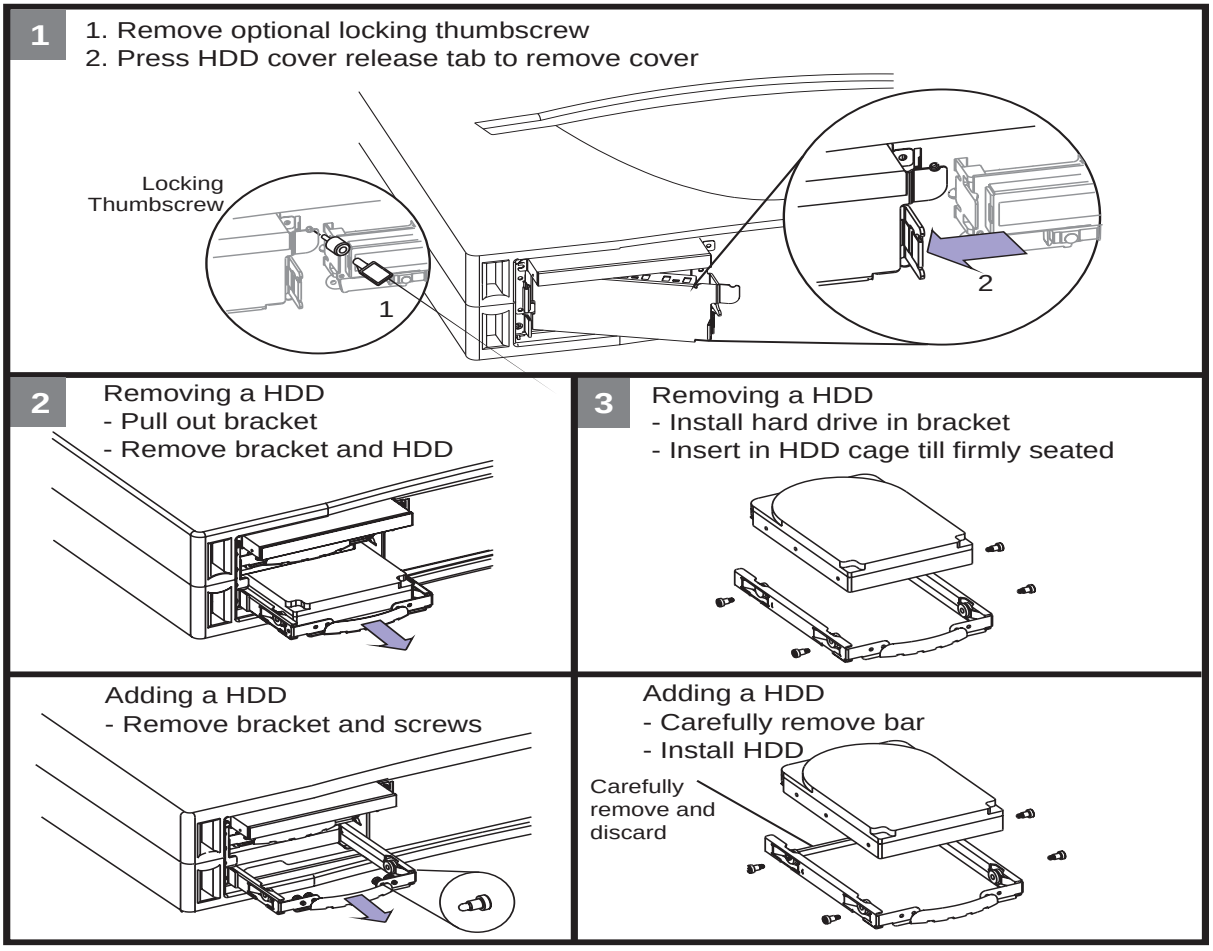


To replace the LCD panel, perform the above steps in reverse.

Removing the Hard Disk Drives

To remove a hard disk drive do the following:

Figure 4-4. Removing the Hard Disk Drives

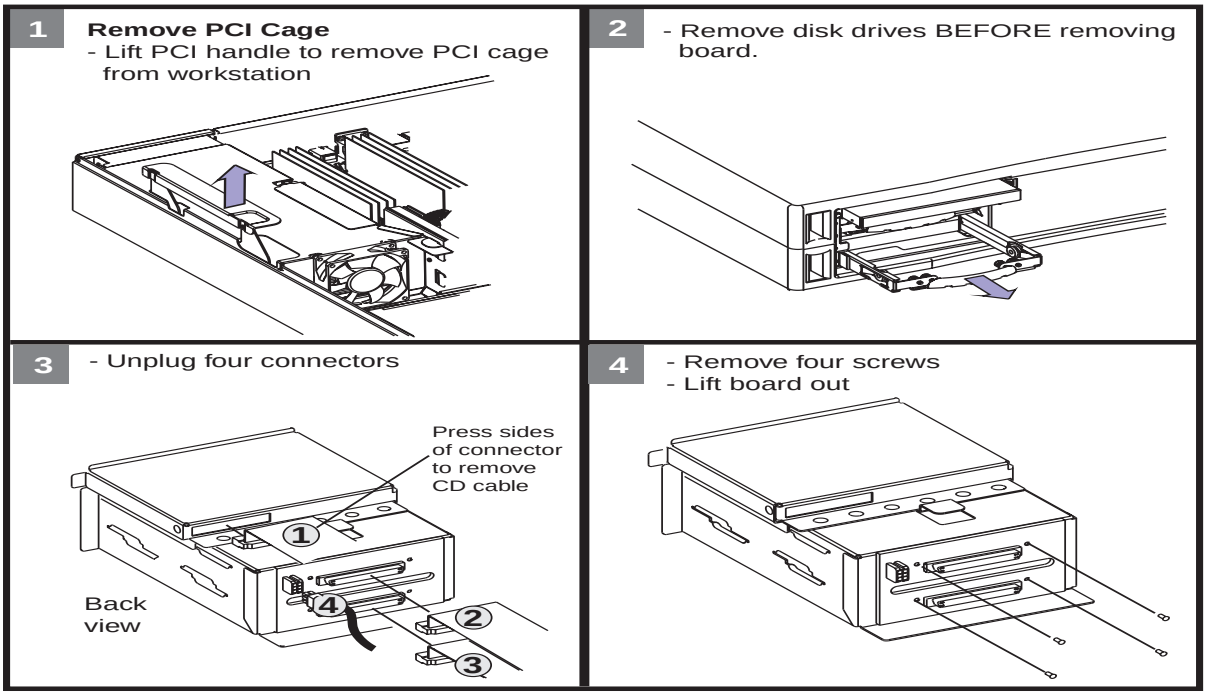


To replace the hard disk drives, perform the above steps in reverse. You should make sure that the disks are firmly seated. Reinstall the hard disk drive cover and optional locking thumbscrew, if applicable.

Removing the Hard Disk Drive Backplane

To replace the hard disk drive backplane, do the following:

Figure 4-5. Removing the Hard Disk Drives Backplane

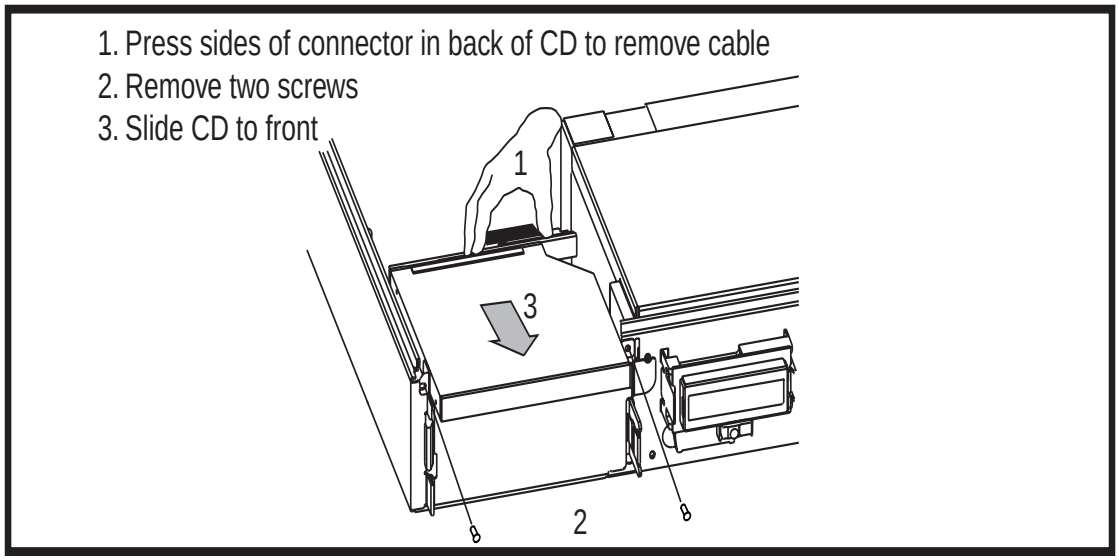


To replace the hard disk drive backplane, perform the above steps in reverse.

Internal CD ROM Drive

To remove the CD ROM drive, do the following:

Figure 4-6. Removing the CD ROM Drive



To replace the CD ROM drive, perform the above steps in reverse.

Removing and Replacing Memory DIMMs

To remove and replace memory DIMMs in the J6700, refer to the memory sequence label inside the system. Be sure to press the tabs at both ends of the DIMM slots to release the DIMM, then lift the DIMM out of the slot.

When replacing the DIMMs, press the DIMM into the slot until the tabs on each end snap into place.

Removing and Replacing the Voltage Regulator Modules (VRMs)

To remove and replace the VRMs, see the section on removing and replacing the system board.

Power Supply

To remove the power supply, do the following:

Figure 4-7. Removing the Power Supply

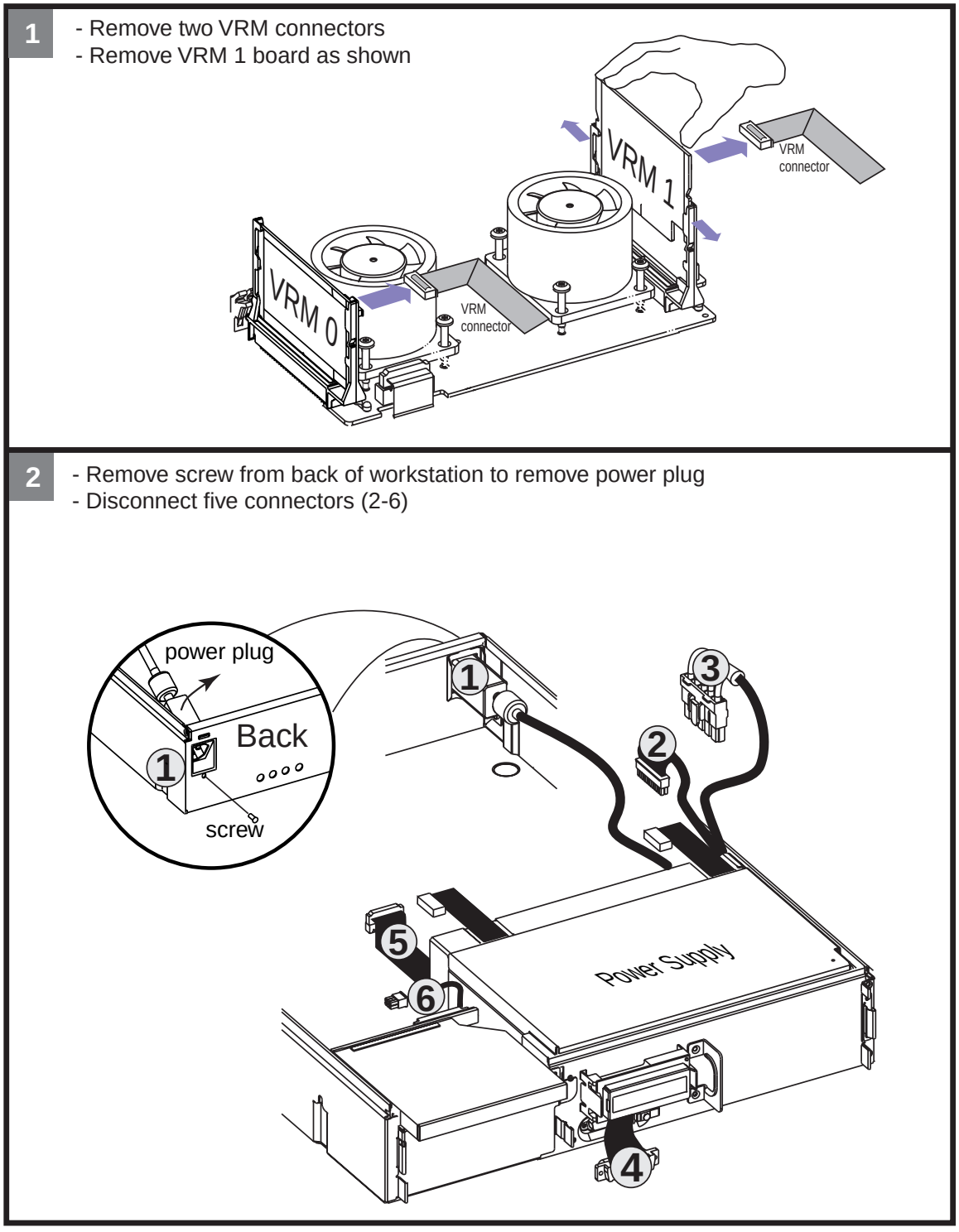
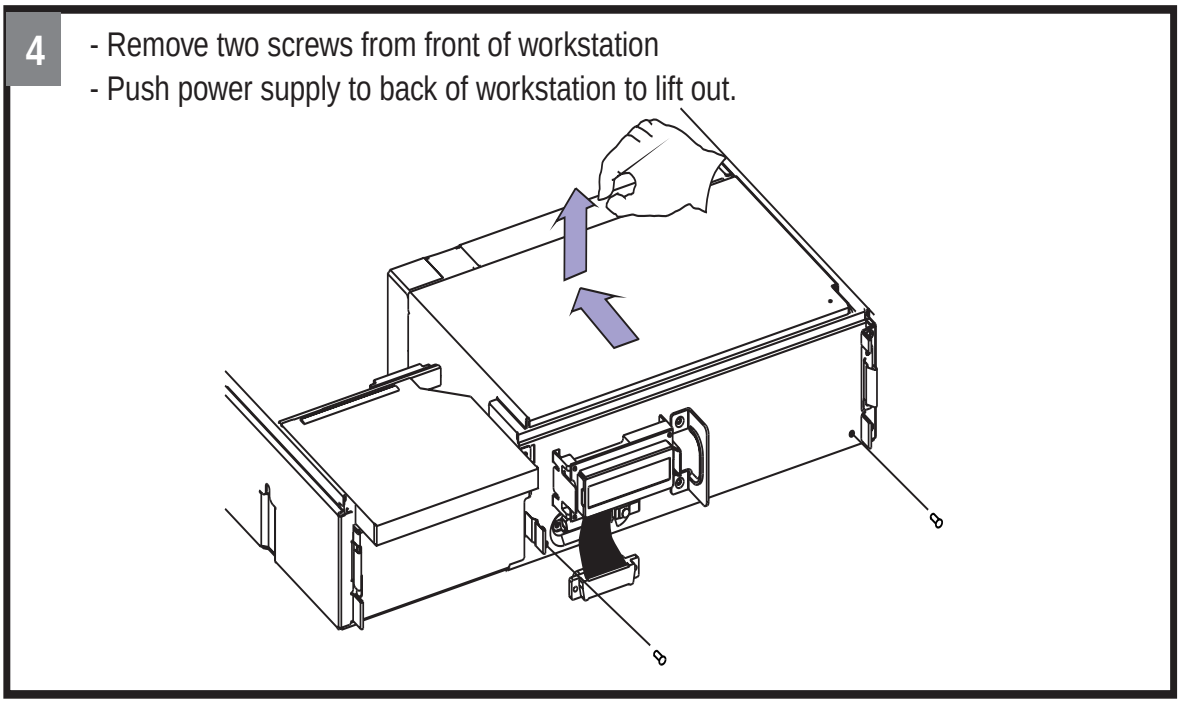


Figure 4-8. Removing the Power Supply (cont'd)



To replace the power supply, do the above steps in reverse.

PCI Cage

To remove the PCI Cage, do the following:

Figure 4-9. Removing the PCI Cage

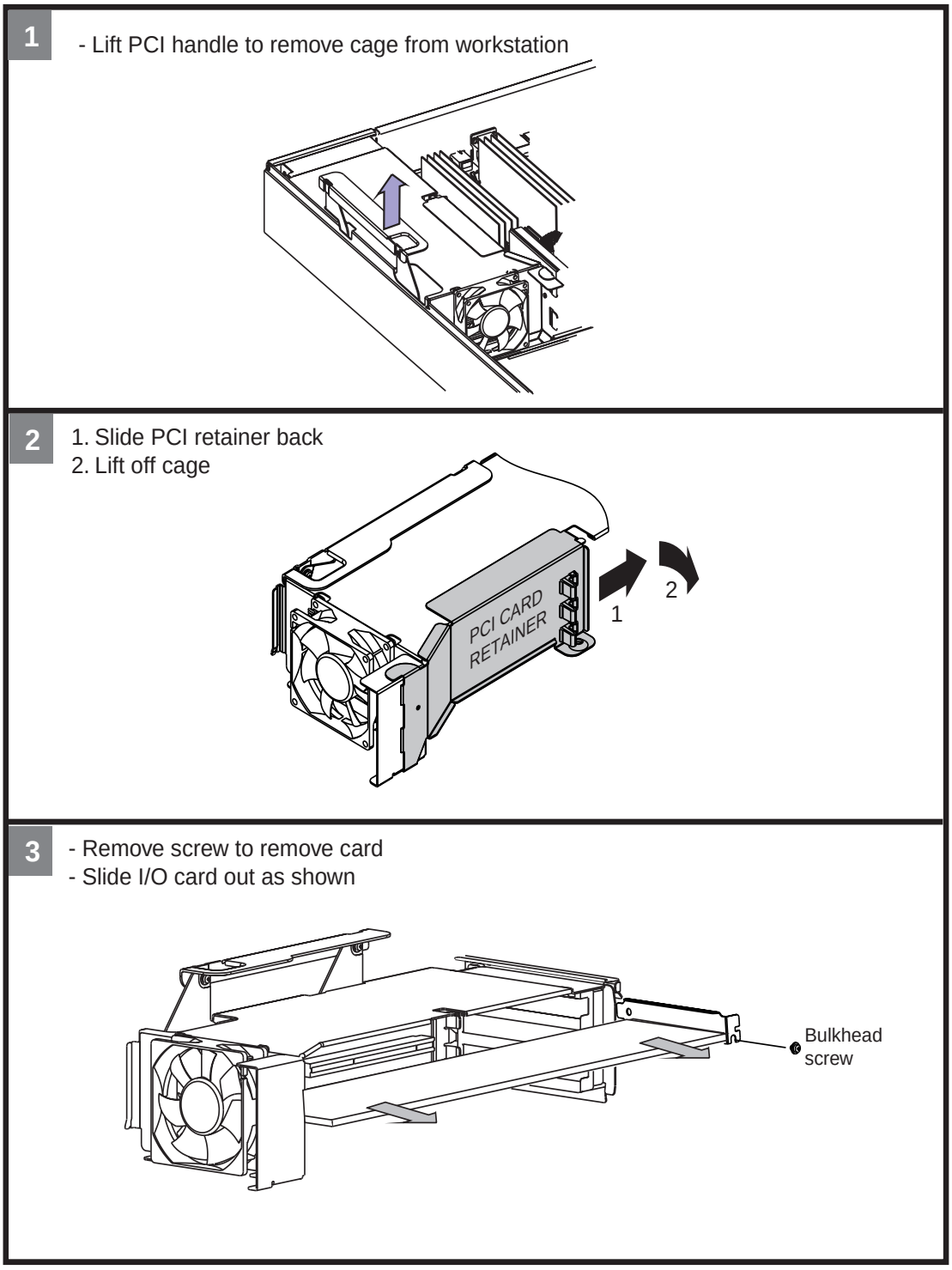
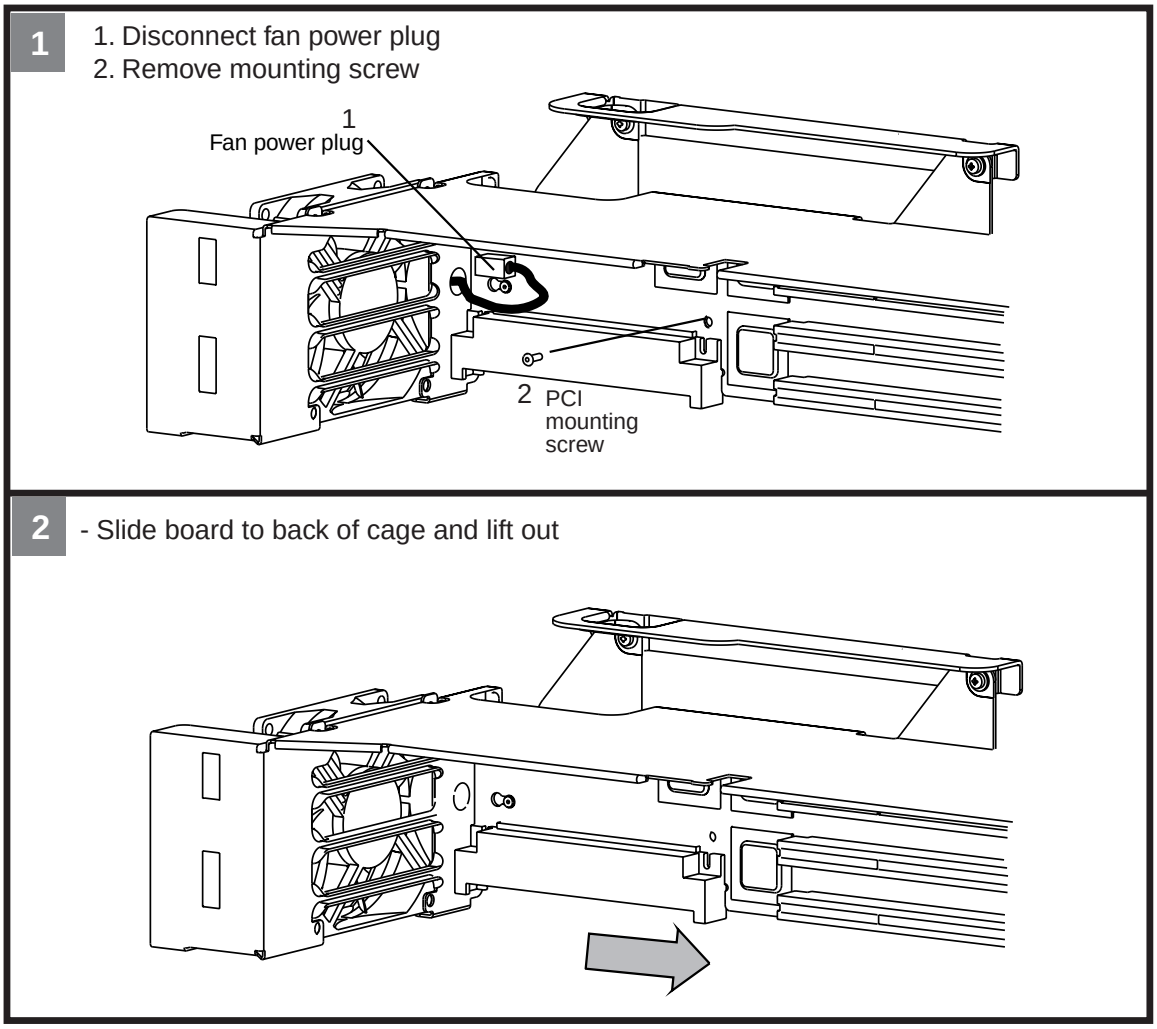


Figure 4-10. Removing the PCI Backplane



To replace the PCI Backplane and Cage, do the above steps in reverse.

Speaker

The speaker is integrated into the power supply. If the speaker fails, replace the power supply.

Removing the System Board

To remove the system board, do the following:

Figure 4-11. Removing the System Board

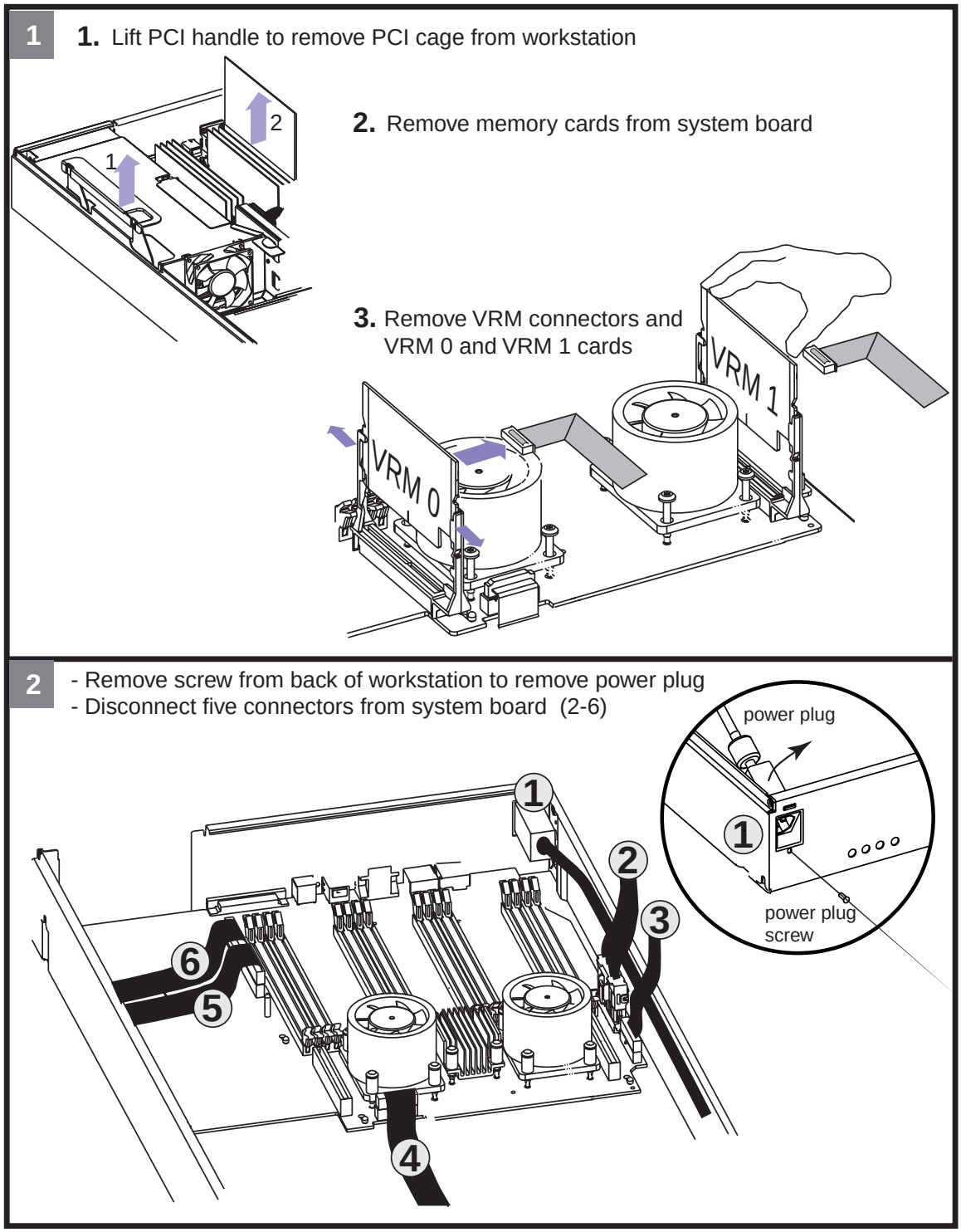
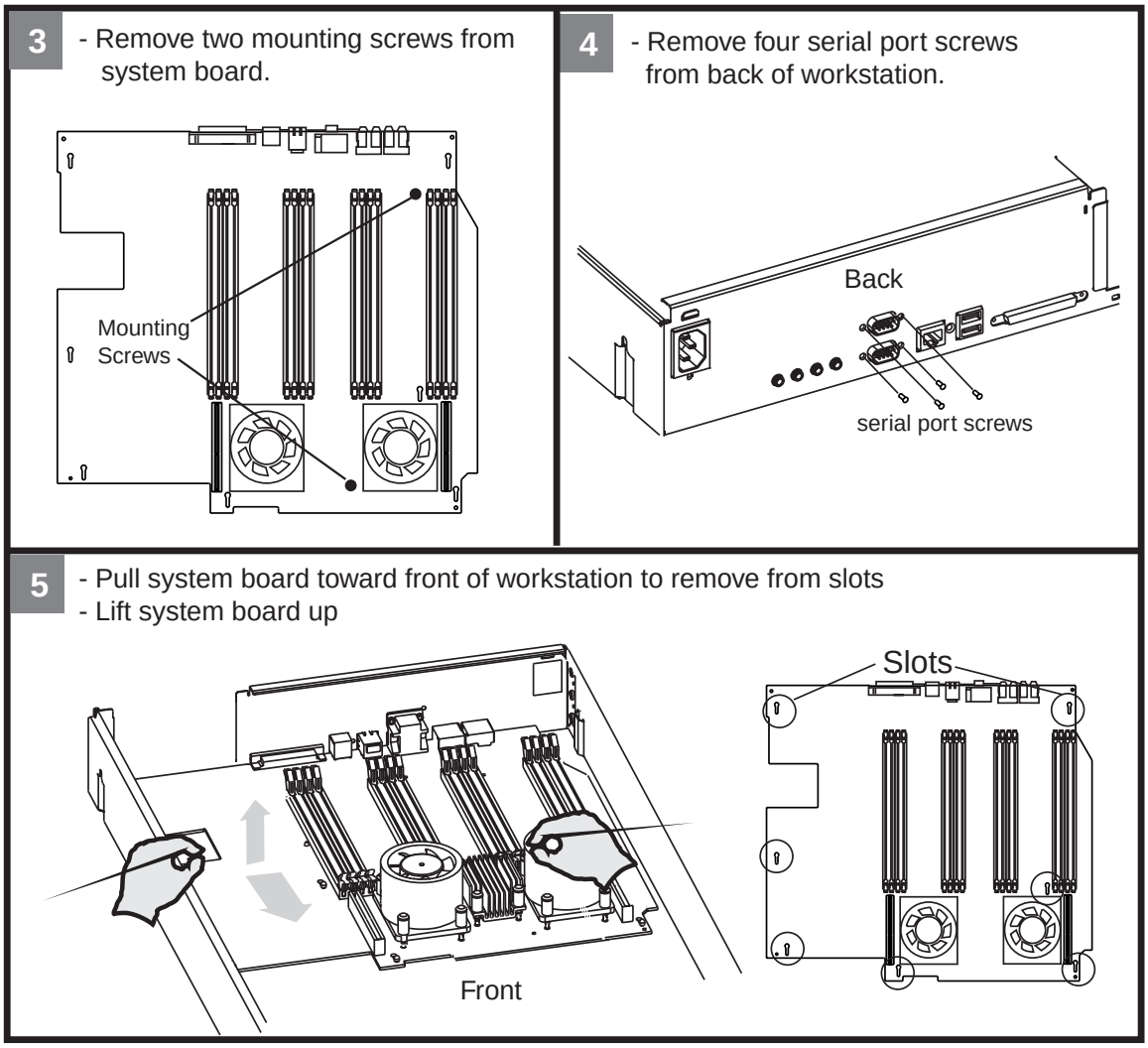


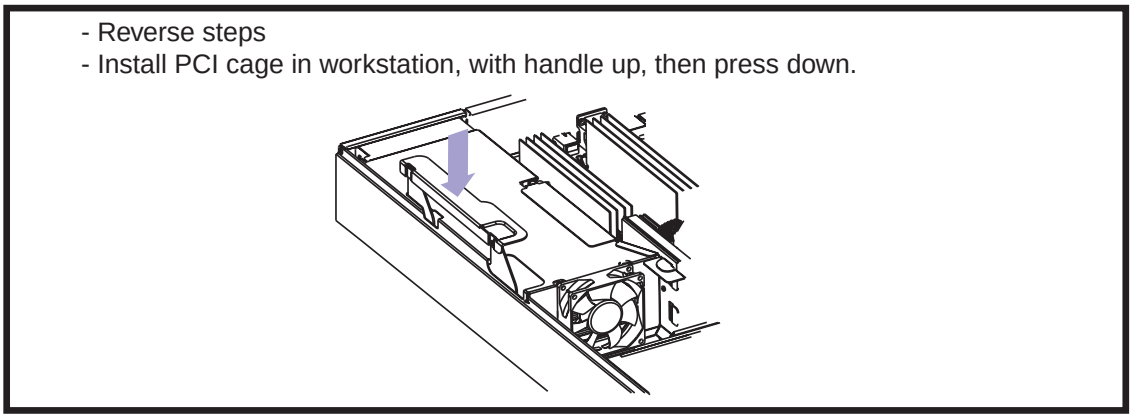
Figure 4-12. Removing the System Board



Replacing the System Board

To replace the system board, perform the above steps in reverse. Pay close attention to installing the PCI cage.

Figure 4-13. Replacing the System Board



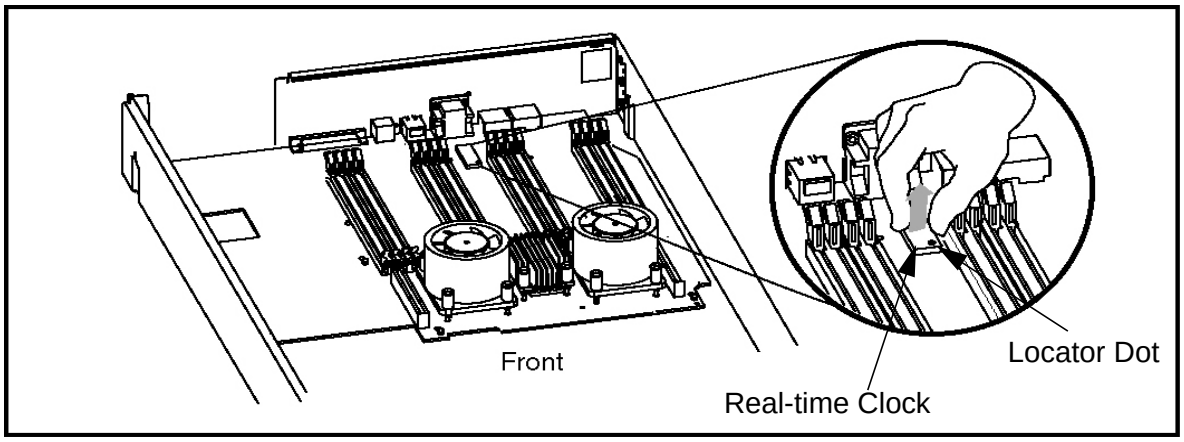
NOTE If you are replacing the system board on a desk side unit, go into the Boot Console Handler (BCH) and set the fan choice to desk side.

NOTE Be sure to install the four serial port screws BEFORE installing the two system board mounting screws.

Removing and Replacing the Real-Time Clock

To remove the real-time clock, you first need to follow the procedure in the section “Front Bezel and Top Cover” of this chapter. After this procedure has been completed, you can remove the real-time clock as shown in Figure 4-14. You may need to rock the real-time clock back and forth to loosen it in its socket.

Figure 4-14. Removing the Real-Time Clock



To replace the real-time clock, reverse the above procedure. Note that you should be careful to not bend any of the real-time clock’s pins, and you must position the locator dot as shown in Figure 4-14. Once the real-time clock is in place, reverse the procedure in the section “Front Bezel and Top Cover” to replace the top cover.

5 Boot Console Handler

This chapter explains how to use the Boot Console Handler, which provides an interactive environment after the power-on sequence in HP VISUALIZE J6700 workstations.

Chapter Overview

This chapter contains the following main sections:

- Boot Console Handler Features
- Accessing the Boot Console Handler
- Boot Console Menus
- Booting the Workstation
- Searching for Bootable Media
- Resetting the Workstation
- Displaying and Setting Paths
- Displaying and Setting the Monitor Type
- Displaying the Current Memory Configuration
- Displaying the Status of the I/O Slots
- Setting the Auto Boot and Auto Search Flags
- Displaying and Setting the Security Mode
- Displaying and Setting Fastboot Mode
- Displaying the LAN Station Address
- Displaying System Information
- Displaying PIM Information
- Using Remote Power-On
- Setting the Fan Speed
- Stable Storage
- ISL Environment

Boot Console Handler Features

There are times when you want to interact directly with the J6700 workstation before it boots the operating system. These workstations provide a menu-driven Boot Console Handler that allows you to perform special tasks, display information, and set certain system parameters, even if the operating system is unavailable.

Here are some of the things you can do:

- Boot the workstation
- Search for bootable media
- Reset the workstation
- Display and set boot paths
- Display and set the monitor type
- Display memory configuration information
- Display the status of the I/O slots
- Set Auto Boot, Auto Search, and Auto Start
- Display and set Security mode
- Set Fastboot
- Display LAN information
- Display system information
- Display PIM information
- Using Remote Power-On
- Setting the Fan Speed

NOTE All of the tasks in the Boot Console Handler should be performed by a system administrator with superuser (`root`) login permissions.

Accessing the Boot Console Handler

To access the Boot Console Handler, follow these steps:

1. Close any files and applications on the workstation.
2. Press the power switch on the front panel of the workstation to power it off.

NOTE There is no need to manually shut down the HP-UX operating system on the workstation before powering it off. When you press the power switch, the workstation automatically shuts down the operating system before terminating the power.

   Make sure you do not unplug the workstation's power cord or otherwise interrupt power to the workstation at this time.

3. Power on the workstation after the system has completely shut down.

   If `auto boot` is turned off, the boot sequence automatically stops at the boot console Main Menu.

   If `auto boot` is turned on, you will see the following message:

   ```
   Processor is starting auto boot process. To discontinue, press any key
   within 10 seconds.
   ```

   If `auto boot` and `auto search` are both turned on, you will see the following message:

   ```
   Processor is booting from first available device. To discontinue, press
   any key within 10 seconds.
   ```

NOTE If you are using a power-saving monitor, you will have less than 10 seconds from the time this message appears to press a key.

4. Press a key. You will then see the following message:

   ```
   Boot terminated
   ```

   The Main Menu of the Boot Console Handler appears.

Boot Console Menus

The boot console menus follow, showing the various tasks you can perform and the available information.

The shortened version of each command is indicated by the uppercase letters.

Help is available for all the menus and commands by using either help, he, or ? and the menu or command for which you want help.

```
------ Main Menu --------------------------------------

Command                              Description

-------                              -----------

BOot [PRI|ALT|<path>]                Boot from specified path
PAth [PRI|ALT|CON|KEY [<path>]]      Display or modify a path
SEArch [DIsplay|[[IPL] [<path>]]]    Search for boot devices

COnfiguration [<command>]            Access Configuration menu/commands
INformation [<command>]              Access Information menu/commands
SERvice [<command>]                  Access Service menu/commands

DIsplay                              Redisplay the current menu
HElp [<menu>|<commands>]             Display help for menu or command
RESET                                Restart the system

Main Menu: Enter command >
```

```
------ Configuration Menu -----------------------------

Command                          Description
-------                          -----------

AUto [BOot|SEArch] [ON|OFF]      Display or set specified flag
BootID [<proc> [<boot ID>]]      Display or modify processor boot ID
BootINfo                         Display boot-related information
CPUconfig [<proc>[ON|OFF]]       Config/deconfig processor
DEfault                          Set the system to predefined values
FanChoice [DeskSide|RackMount]   Display or set the fan preference

FastBoot [ON|OFF]                Display or set boot tests execution
LanConfig [<config_type>]        Display or set LAN configuration
MOnitor [LIST|[<path> <type>]]   Change the current monitor type
PAth [PRI|ALT|CON|KEY [<path>]]  Display or modify a path
PreviousPower [ON|OFF]           Set previous power state
SEArch [DIsplay|[[IPL][<path>]]  Search for boot devices
SECure [ON|OFF]                  Set/show security mode
TIme [c:y:m:d:h:m:s]             Read or set real time clock in GMT

BOot [PRI|ALT|<path>]            Boot from specified path
DIsplay                          Redisplay the current menu
HElp [<menu>|<command>]          Display help for menu or command
RESET                            Restart the system
MAin                             Return to Main Menu
-----
Configuration Menu: Enter command >
```

```
------ Information Menu -------------------------------

Command                  Description
-------                  -----------

ALL                      Display all system information
BootINfo                 Display boot-related information
CAche                    Display cache information
ChipRevisions            Display revisions of VLSI and firmware
COprocessor              Display coprocessor information
FwrVersion               Display firmware version
IO                       Display I/O interface information
LanAddress               Display built-in system LAN address
MEmory                   Display memory information
PRocessor                Display processor information
SysConfig                Display the system configuration
WArnings                 Display selftest warning messages

BOot [PRI|ALT|<path>]    Boot from specified path
DIsplay                  Redisplay the current menu
HElp [<menu>|<command>] Display help for menu or command
RESET                    Restart the system
MAin                     Return to Main Menu
------
Information Menu: Enter command >
```

```
------ Service Menu ---------------------------------

Command                          Description
-------                          -----------

ChassisCodes [<proc>|ON|OFF]     Display/enable/disable chassis codes
CLEARPIM                         Clear (zero) the contents of PIM
EepromRead [<addr> [<len>]]      Read EEPROM locations
MemRead <addr>[<len>] [<type>]   Read memory locations
PciDelay [<value>]               Display or set PCI delay value
PDT [CLEAR]                      Display or clear the Page
                                 Deallocation Table
PIM [<proc>] [HPMC|LPMC|TOC]     Display PIM information

RemotePower [ON|OFF]             Display/enable/disable remote power
ScRoll [ON|OFF]                  Display or change scrolling ability

BOot [PRI|ALT|<path>]            Boot from specified path
DIsplay                          Redisplay the current menu
HElp [<menu>|<command>]          Display help for menu or command
RESET                            Restart the system
MAin                             Return to Main Menu
-----
Service Menu: Enter command >
```

Booting the Workstation

You usually start a workstation by turning it on and waiting for HP-UX to boot automatically. However, you may not always want the usual boot sequence to occur.

For example, you may want to start the workstation from an operating system that is stored on a device that is different from the usual boot device. If the normal operating system kernel or the disk on which it resides becomes damaged or unusable, you may wish to boot from a different disk or perhaps from another type of device, such as a CD ROM drive.

Here are some possible booting scenarios you may encounter:

- If you know which device you want to boot from, and you know that it contains a bootable operating system, follow the directions in "Accessing the Boot Console Handler" on, and then type the following at the prompt:

  ```
  Main Menu: Enter command > boot device [Enter]
  ```

  where *device* is the hardware path to the device, specified in Mnemonic Style Notation. For example, if you wish to boot an operating system that is stored on an IDE CD ROM drive, you would type the following command at the prompt:

  ```
  Main Menu: Enter command > boot IDE [Enter]
  ```

- If you do not know which device you want to boot from, then type the following at the prompt:

  ```
  Main Menu: Enter command > search [Enter]
  ```

  A message similar to the following will be displayed:

  ```
  Path Number    Device Path      Device Type
  -------------  -------------    ------------

  P0             IDE              TEAC CD-532E-B
  P1             FWSCSI.6.0       SEAGATE ST39102LC
  ```

  At the prompt, you might type the following:

  ```
  Main Menu: Enter command > boot P1 [Enter]
  ```

  Note that the operating system on the specified device (P1) is used to boot the system (also see the next section, "Searching for Bootable Media").

- If you wish to interact with the Initial System Loader (ISL) before booting the workstation, follow the directions in the section "Accessing the Boot Console Interface" found in this chapter, and type the following at the prompt:

  ```
  Main Menu: Enter command > boot device [Enter]
  ```

  The following prompt will appear:

  ```
  Interact with ISL (Y,N,Q)>
  ```

  Answering yes (Y) causes the ISL to be loaded from the specified device. After a short time, the following prompt appears on the screen:

  ```
  ISL>
  ```

  ISL is the program that actually controls the loading of the operating system. By interacting with ISL, you can choose to load an alternate version of the HP-UX operating system. If you do not want to interact with ISL, you must enter no (N).

  For example, if the usual kernel (/stand/vmunix) on the root disk (fwscsi.6.0) has become corrupted, and you wish to boot the workstation from the backup kernel (/stand/vmunix.prev), type the following at the ISL> prompt:

  ```
  ISL> hpux /stand/vmunix.prev [Enter]
  ```

- If you do not know which media in the file systems have bootable operating systems, you can find them with the search ipl command. See the next section, "Searching for Bootable Media."

Searching for Bootable Media

To list all devices that contain bootable media, follow the directions in the section "Accessing the Boot Console Handler" found in this chapter, and type the following at the prompt:

```
Main Menu: Enter command > search ipl [Enter]
```

The `search` command searches all buses. The search may turn up more devices than there are lines on the display. If you are using a text terminal, you can control the progress of the search from the terminal's keyboard by doing any of the following:

- To temporarily suspend the search, press `[Ctrl]-[S]`.
- To continue the search, press `[Ctrl]-[Q]`.
- To halt the search, press any other key.

These flow-control commands do not work with a bit-mapped display, but such a display can show more than forty lines of text, so you are unlikely to need them.

To search for devices of just one type that actually contain bootable media, follow the directions in the section "Accessing the Boot Console Handler" found in this chapter, and then type the following at the prompt:

```
Main Menu: Enter command > search ipl device_type [Enter]
```

where *`device_type`* is one of the following:

- `fwscsi` is the internal, Wide LVD (Low Voltage Differential) SCSI bus.
- `scsi` is the external, SE/LVD (Single-Ended/Low-Voltage Differential) SCSI bus.
- `lan` is all connections to the built-in LAN.
- `ide` is the built-in CD ROM drive.
- `pci`*`n`* is an optional SCSI interface in slot number *n*.

For more information about the `search` command, type the following at the prompt:

```
Main Menu: Enter command > help search [Enter]
```

Resetting the Workstation

To reset the workstation to its predefined values, follow the directions in the section "Accessing the Boot Console Handler" found in this chapter, and type the following at the prompt to access the Configuration Menu:

```
Main Menu: Enter command > co [Enter]
```

When the Configuration Menu appears, type the following at the prompt:

```
Configuration Menu: Enter command > default [Enter]
```

Then type the following at the prompt:

```
Configuration Menu: Enter command > reset [Enter]
```

Displaying and Setting Paths

A path is the hardware address of a device that is attached to the I/O system of a workstation. The `path` command sets the system paths shown in Table 5-1.

The `path` command sets and displays the hardware address of a specified device attached to the I/O bus of the workstation.

Table 5-1. System Paths

Path Type	Device
`primary` or `pri`	The workstation's default boot device (usually the root disk)
`alternate` or `alt`	The workstation's alternate boot device (usually a DDS-format tape device)
`console` or `con`	The workstation's primary display device
`keyboard` or `key`	The workstation's primary ASCII input device

To display the current settings for the system paths, type the following at the prompt:

```
Main Menu: Enter command > path [Enter]
```

The paths are displayed in Mnemonic Style Notation, as shown in Table 5-2.

Table 5-2. Mnemonic Style Notation

I/O Type	Specification Format
Internal LVD SCSI	`fwscsi.`*`scsi_address.logical_unit_number`*
External SE/LVD SCSI	`scsi.`*`scsi_address.logical_unit_number`*
Built-in LAN	`lan.`*`server_address.init_timeout.io_timeout`*
Optional SCSI	`pci`*`n.scsi_address.logical_unit_number`*
Built-in IDE	`IDE`

To display the current setting for a particular system path, follow the directions in the section "Accessing the Boot Console Handler" found in this chapter, and type the following at the prompt:

```
Main Menu: Enter command > path path_type [Enter]
```

where *`path_type`* is one of the path types listed in Table 5-1.

For example, to get the path to the primary boot device, follow the directions in the section "Accessing the Boot Console Handler" found in this chapter, and type the following at the prompt:

```
Main Menu: Enter command > path primary [Enter]
```

To set a system path to a new value, follow the directions in the section “Accessing the Boot Console Handler” found in this chapter, and type the following at the prompt:

```
Main Menu: Enter command > path path_type path [Enter]
```

where *path_type* is one of the path types listed in Table 5-1 and *path* is the specification of the path in Mnemonic Style Notation (as described in Table 5-2). For example, to set the primary boot path to a SCSI disk with an ID of 6.0, follow the directions in “Accessing the Boot Console Handler” on, and then type the following at the prompt:

```
Main Menu: Enter command > path pri scsi.6.0 [Enter]
```

Displaying and Setting the Monitor Type

The workstation ships from the factory preset to use a monitor with a specific resolution and frequency. If the workstation's monitor is replaced with a different type of monitor, you may have to reconfigure the workstation to support the new monitor.

The Monitor Command

The `monitor` command lets you change the workstation's graphics configuration. This command is available in the Configuration Menu of the Boot Console Handler.

NOTE The `monitor` command lets you change a workstation's graphics configuration before you replace the monitor. For information about changing the configuration after you replace the monitor, go to the section "Setting the Monitor Type at Power On" found in this chapter.

To display the current graphics and console information, type the following set of commands:

```
Main Menu: Enter command > configuration [Enter]
Configuration Menu: Enter command > monitor [Enter]
```

The correct usage for setting the graphics configuration is:

```
Configuration Menu: Enter command > monitor graphics_path type [Enter]
```

where valid *graphics_path* parameters are:

- `graphics(1)` - Graphics adapter installed in slot 1
- `graphics(2)` - Graphics adapter installed in slot 2
- `graphics(3)` - Graphics adapter installed in slot 3

NOTE No blanks or spaces may be used in the *graphics_path*.

type is the numerical monitor type as shown with the monitor list command. See the section "Setting the Monitor Type" found in this chapter for a list of types. For example, a graphics card installed in option slot 1 would be `graphics(1)`.

Displaying the Current Monitor Configuration

To display the current monitor configuration for the workstation from the Configuration Menu of the Boot Console Handler, follow the directions in the section "Accessing the Boot Console Handler" found in this chapter. Once you are in the Boot Console Handler's Main Menu, type:

```
Main Menu: Enter command > configuration [Enter]
```

This places you in the Configuration Menu. From here, type:

```
Configuration Menu: Enter command > monitor [Enter]
```

This displays a list of the current graphics adapters and their monitor types configured for the workstation. For example:

```
MONITOR INFORMATION
Path         Slot  Head   HPA          Resolution  Freq  Type  Class
------------     --------  -------  ------------       ----------------  -------  -------  -------
GRAPHICS(1)  1     1    fffa000000  1600x1200  75Hz   8    PCI
Configuration Menu: Enter command >
```

In this example, only the graphics adapter (located in slot 1) `GRAPHICS(1)` is configured. The monitor type for `GRAPHICS(1)` is set to type 8, which (for this graphics adapter) is a 1600x1200 monitor that uses a frequency of 75 Hz.

Setting the Monitor Type

You can set the monitor type for a graphics adapter by typing the following:

```
Configuration Menu: Enter command > monitor graphics(n) tt [Enter]
```

where *n* is the number of the graphics adapter and *tt* is the monitor type.

To display a list of supported monitors that are used by a graphics card, type the following:

```
Configuration Menu: Enter command > monitor list [Enter]
```

A list of valid monitor types similar to the following is displayed.

NOTE Each graphics adapter will have a different list of valid monitor types. The meaning of any monitor type will therefore differ for each graphics adapter.

```
MONITOR INFORMATION

Path       Slot Head Type    Size    Freq Class
----       ---- ---- ----  --------- ---- -----
GRAPHICS(1)  1    1    1   1280x1024 75Hz PCI
GRAPHICS(1)  1    1    2   1280x1024 75Hz PCI, Double buffered
GRAPHICS(1)  1    1    3   1280x1024 75Hz PCI, Greyscale
GRAPHICS(1)  1    1    4   1280x1024 75Hz PCI, Double buffered, Greyscale
GRAPHICS(1)  1    1    5   1280x768  75Hz PCI
GRAPHICS(1)  1    1    6    800x600  75Hz PCI
GRAPHICS(1)  1    1    7    640x480  75Hz PCI
GRAPHICS(1)  1    1    8   1600x1200 75Hz PCI
GRAPHICS(1)  1    1    9   1600x1200 75Hz PCI, Greyscale
GRAPHICS(1)  1    1   10   1200x1600 75Hz PCI
GRAPHICS(1)  1    1   11   1200x1600 75Hz PCI, Greyscale
GRAPHICS(1)  1    1   12   1280x1024 72Hz
GRAPHICS(1)  1    1   13   1280x1024 72Hz Double buffered
GRAPHICS(1)  1    1   14    640x480  60Hz
GRAPHICS(1)  1    1   15   ---------- user defined -----------

Configuration Menu: Enter command >
```

To set the monitor type for `GRAPHICS(1)` to monitor type 8, type the following:

```
Configuration Menu: Enter command > monitor graphics(1) 8 [Enter]
```

This will take effect on the next reboot or reset of the workstation.

```
MONITOR INFORMATION
Path       Slot   Head  HPA         Resolution  Freq  Type  Class
------------     --------  --------  ------------       -----------------  -------  -------   -------
GRAPHICS(1)  1     1   fffa000000  1600x1200  75Hz  8    PCI
```

The new monitor selection will either take effect the next time you reboot the workstation if this is a non-console monitor, or immediately if this is a console monitor. The boot console also displays the new monitor information.

Trying to change the monitor type to a number not listed for that graphics device fails and gives you the following warning message:

```
Value of monitor type n out of range (n - nn)
```

NOTE Changing the monitor type on an empty slot works; the monitor type will be saved for a future graphics card.

Setting the Monitor Type at Power On

If you replace a workstation's monitor with a different monitor type, and do not set the workstation's graphics parameters by using the monitor command before doing so, you may need to perform the following if your screen is blank.

Cycle the power to the workstation. Wait 2 seconds after the Num Lock light flashes near the end of the boot sequence, and then press [Tab] to initiate the automatic monitor selection process. If the screen remains blank after two minutes, however, see the "Troubleshooting Monitor Problems" subsection on the next page.

NOTE It takes approximately one minute after powering on the workstation before the Num Lock light flashes.

The system cycles through the available monitor types one at a time. When you see a message similar to the following, and it is the correct monitor type, select the monitor type by pressing [Enter]:

```
MONITOR INFORMATION
Path        Slot   Head   Type     Size          Freq  Type  Class
------------     ---------  --------  ------------  ------------------    -------   -------  -------
GRAPHICS(1) 1      1      n       nnnnxnnnn    nnHz    8     PCI
Press [RETURN] to select this monitor type (type n of n types)
```

The system queries you to confirm your selection. Press Y (yes) to save this monitor type.

If you press any key other than Y, the following message is displayed:

```
Monitor type not saved.
```

At this point, the new monitor type is active, but not saved. Because you did not save the monitor type, the next time you reboot the workstation the original monitor type will be used.

Next, the following message is displayed:

```
To select a new Graphics Monitor Type press the <TAB> key now, otherwise
EXIT by entering any other key (or will time out in 15 seconds)...
```

To restart the monitor selection process, press [Tab].

Troubleshooting Monitor Problems

In the event that the console stops displaying to the graphics device, use the following procedure to set the console for displaying to an external terminal:

1. Turn off the workstation's power.
2. Disconnect the USB keyboard connector from the rear panel.
3. Connect a serial terminal emulator to the Serial 1 connector (the left serial connector) on the rear panel. Configure the terminal for: 9600 baud, No Stop Bits, No Parity, and 8 Bits.
4. Power on the workstation. The system will now display the console to the terminal connected to Serial 1 port. Note that you can use a 9-pin to 9-pin serial cable (HP Part Number F1044-80002) to connect an HP OmniBook serial port to the workstation.
5. Set the monitor type and path using the Boot Console Handler.

Changing the Console to an External Terminal

In the event that the console stops displaying to the graphics device, use the following procedure to display the console to an external Serial terminal so that you can configure the graphics console:

1. Turn off the workstation's power.
2. Disconnect the USB keyboard connector from the rear panel.
3. Connect a Serial terminal to the Serial 1 connector (the left serial connector) on the rear panel. Configure the terminal for: 9600 baud, No Stop Bits, No Parity, and 8 Bits.
4. Power on the workstation.

The workstation will now display the console to the terminal connected to the Serial 1 port.

Displaying the Current Memory Configuration

The following sample screen output uses the `memory` command to show a memory configuration table with properly-installed and configured memory.

To display the current memory configuration for a workstation, first follow the directions in the section “Accessing the Boot Console Handler” found in this chapter. Once you are in the Boot Console Handler’s Main Menu, type the following:

```
Main Menu: Enter command > information [Enter]
```

This places you in the Information Menu. From here, type the following:

```
Information Menu: Enter command > memory [Enter]
```

The screen displays status and configuration information for the memory DIMMs installed in the workstation. The following sample shows the memory information when memory DIMMs are properly installed and configured.

```
       MEMORY INFORMATION


         MEMORY STATUS TABLE

         Slot    Size (A)    Status (A)      Size (B)    Status (B)
         ----    ------      -------------   --------    ----------
         0a/0b   512MB       Active            512MB      Active
         1a/1b   512MB       Active            512MB      Active
         2a/2b   512MB       Active            512MB      Active
         3a/3b   512MB       Active            512MB      Active
            4a/4b   512MB    Active            512MB      Active
         5a/5b   512MB       Active            512MB      Active
         6a/6b   512MB       Active            512MB      Active
        7a/7b   512MB       Active            512MB      Active

TOTAL MEMORY = 8192MB

 MEMORY FAULT TABLE

 Slot    Size    Status

 ----    ------   -------------
```

Memory Installation Guidelines

For best performance, load DIMMs in ascending slot order: 0, 1, 2, ...

- For DIMMs to work, both DIMMs in a slot pair (a/b) must be the same type. (Same part number = same type)

```
Active, Installed Memory          : 768MB of SDRAM
   Deallocated Pages              : 0 Pages
                                  -----------
   Available Memory               : 768MB

   Good Memory Required by OS     :           0 (Not Initialized)
         Memory
   HVERSION  SVERSION
   -------- ----------
    0x0860   0x0900
```

Displaying the Status of the I/O Slots

The `IO` command lets you identify all built-in I/O devices and optional I/O devices installed in the option slots. It is available in the Information Menu.

To use the `IO` command from the Information Menu of the Boot Console Handler, type the following:

```
Information Menu: Enter command > io [Enter]
```

Information about the built-in and optional I/O devices is displayed. For example:

```
I/O MODULE INFORMATION

                                                              IODC  IODC
Path          Decimal     Type          Location  HVER  SVER  Vers  Dep
----          -------     ----          --------  ----  ----  ----  ---
LAN           10/0/12/0   Ethernet      built-in  0060  a200  0x02  0x00
AUDIO         10/0/13/0   Audio         built-in
IDE           10/0/14/0   IDE           built-in  0060  a300  0x00  0x00
SUPERIO MISC  10/0/14/0   Bridge Device built-in
SERIAL_1      10/0/14/1/1 RS232 port    built-in  0060  8c00  0x01  0x00
SERIAL_2      10/0/14/1/2 RS232 port    built-in  0060  8c00  0x01  0x00
USB           10/0/14/2   USB           built-in  0060  a900  0x95  0x00
SCSI          10/0/15/0   SCSI          built-in  0060  a300  0x00  0x00
FWSCSI        10/0/15/1   SCSI          built-in  0060  a300  0x00  0x00
GRAPHICS(2)   10/4/2/0    Display       slot 2    0070  8500  0x01  0x00

Main Menu: Enter command >
```

Setting the Auto Boot and Auto Search Flags

The auto boot and auto search flags are variables stored in the system's non-volatile memory. (Non-volatile memory retains its contents even after power is turned off.) If you reset these flags to new values, the change takes effect the next time you reboot the workstation.

To examine the state of the auto boot and auto search flags, type the following:

```
Configuration Menu: Enter command > auto [Enter]
```

If auto boot is set to on, the workstation automatically attempts to boot the operating system when powered on. If auto boot is set to off, the workstation enters the boot administration mode of the Boot Console Handler.

The state of the auto search flag determines how the workstation seeks a boot device during autoboot. If auto search is set to on, the workstation will search for other boot devices if the primary boot device is not available. If auto search is off, the workstation will default to the boot administration mode if it can't see the primary boot device.

To change the state of the auto boot or auto search flags, type either:

```
Configuration Menu: Enter command > auto boot state [Enter]
```

OR:

```
Configuration Menu: Enter command > auto search state [Enter]
```

where *state* is on or off.

Displaying and Setting the Security Mode

The secure flag is a variable stored in non-volatile memory. (Non-volatile memory retains its contents even after power is turned off.) If you reset this flag to a new value, the change takes effect the next time you reboot the workstation.

When the secure flag is set to on, auto boot and auto search are enabled and cannot be stopped. The workstation boots from the default boot paths regardless of user intervention.

To display the current setting for the secure flag, type the following:

```
Configuration Menu: Enter command > secure [Enter]
```

To set the secure flag on, type the following:

```
Configuration Menu: Enter command > secure on [Enter]
```

To set the secure flag off, you need to disconnect all possible boot devices to interrupt the boot sequence and force the prompt to the Boot Console Handler. Next, type the following:

```
Configuration Menu: Enter command > secure off [Enter]
```

Displaying and Setting Fastboot Mode

When `fastboot` is enabled (set to `on`), the workstation does a quick check of the memory and skips some processor selftests during its power-on selftests. This enables the workstation to complete its boot process quicker. The default factory setting is for `fastboot` to be enabled (set to `on`).

When `fastboot` is disabled (set to `off`), more extensive memory and processor testing is performed during the selftests, causing the boot process to take longer.

If you are experiencing difficulty in booting the workstation, set `fastboot` to `off` and reboot the system. The more extensive testing may reveal the error condition.

To display the status of `fastboot`, type the following:

```
Configuration Menu: Enter command > fastboot [Enter]
```

To disable `fastboot`, type the following:

```
Configuration Menu: Enter command > fastboot off [Enter]
```

To enable `fastboot`, type the following:

```
Configuration Menu: Enter command > fastboot on [Enter]
```

Displaying the LAN Station Address

It is sometimes necessary to supply the LAN station address of the workstation to other users. For example, if the workstation is to become a member of a cluster, the cluster administrator needs to know the LAN station address in order to add the workstation to the cluster.

A LAN station address is the label that uniquely identifies the LAN connection for the workstation at the link level (the hardware level).

To display the workstation's LAN station address, type the following:

```
Information Menu: Enter command > lanaddress [Enter]
```

The LAN station address is displayed as a twelve-digit number in hexadecimal notation, similar to the following:

```
LAN Station Addresses:        001083-000429
```

The address is for the workstation's built-in LAN interface.

Displaying System Information

The `all` command allows you to display the system's processor revision and speed, cache size, memory size, flag settings, and the boot and console paths. To display system information, from the Information Menu type the following:

```
Information Menu: Enter command > all [Enter]
```

This information is paged to allow you to view it as necessary, unless the `ScRoll` command has been used to disable scrolling.

Displaying PIM Information

The `pim` command allows you to display the most recent PIM information for the specified fault type. To display PIM information for a specific fault, from the Service Menu, type the following:

```
Service Menu: Enter command > pim processor_number fault_type [Enter]
```

Using Remote Power-On

The J6700 workstation has a remote power-on feature that allows you to power up and shut down your workstation remotely through the RS232 port. The RS232 receive line is monitored by the system board Remote Power Controller (RPC). This controller responds to the following commands:

Press:	Type:	Description
Esc	`rsys^on`	Turns the system on
Esc	`rsys^off`	Turns the system off
Esc	`rsys^ton`	Turns the system off without soft-power down
Esc	`pic^sleep`	Causes RPC to stop responding to commands

If the remote-power jumper is set to the enable position (factory default), the Remote Power Controller will always be able to turn on a system the first time AC power is applied. Once the system is powered up, further command processing will depend on the state of the firmware's "remote power" bit, which is set using the Boot Console Handler (see the "Boot Console Handler" chapter in this document). If the remote power bit is set to ON, the Remote Power Controller will continue to process commands only if the Remote Power Controller has not been put into the sleep mode. If the remote power bit is set to OFF, the Remote Power Controller will not respond to commands.

If the Remote Power Controller has been placed in the sleep mode, you can re-enable the Remote Power Controller by following this procedure:

1. Reboot your workstation. If `auto boot` is turned off, the boot sequence automatically stops at the boot console **Main Menu**. If `auto boot` is turned on, you will see the following message:

   ```
   Processor is starting auto boot process. To
   discontinue, press any key within 10 seconds.
   ```

   If `auto boot` and `auto search` are both turned on, you will see the following message:

   ```
   Processor is booting from first available de-
   vice. To discontinue, press any key within 10
   seconds.
   ```

NOTE If you are using a power-saving monitor, you will have less than 10 seconds from the time this message appears to press a key.

2. Press any key. You will then see the message:

```
Boot terminated
```

   The **Main Menu** of the boot console appears.

3. At the **Main Menu** prompt, type the following and press **Enter**:

```
Main Menu: Enter command > service
```

4. Turn remote power off by typing the following at the prompt and press **Enter**:

```
Service Menu: Enter command > RemotePower OFF
```

   Next, turn remote power on by typing the following at the prompt and press **Enter**:

```
Service Menu: Enter command > RemotePower ON
```

   The Remote Power Controller is now enabled.

5. Return to the **Main Menu** by typing the following at the prompt and press **Enter**:

```
Service Menu: Enter command > main
```

6. Continue booting the system by typing the following at the prompt and press **Enter**:

```
Main Menu: Enter command > boot
```

7. Answer "N" to the question, `INTERACT WITH IPL (Y,N,Q)?`

Troubleshooting Hint for an Unresponsive RPC

If the Remote Power Controller (RPC) is enabled and it seems to be unresponsive, press the **Enter** key several (approximately 15 times) times. You need to do this because the Remote Power Controller auto senses the baud rate at the beginning of each command (that is, when you press **Enter**). It does this by measuring the width of the start bit of the first character it sees. Because the Remote Power Controller does not know the difference between the beginning of a command or any other data that may occur on the receive line, the Remote Power Controller can set the baud rate to an incorrect value if the first character it sees has the lowest order bit or bits set. The Remote Power Controller has an input buffer of a fixed size; therefore, pressing the **Enter** key 15 or more times causes the buffer to overflow, resetting the Remote Power Controller. If the baud rate was set to some real extreme value, you may have to try this process several times.

Setting the Fan Speed

There are two fan speed settings available on the J6700 workstation. The RackMount fan speed is used for J6700s that are installed in a rack. The DeskSide fan speed is used for J6700s that are used as desk-side systems. These fan speeds are set using the Boot Console Handler (bch). To set the fan speeds, follow the procedures discussed in this section.

Rack-Mount Fan Speed

If you currently have a desk-side workstation that you want to convert to a rack-mount workstation, you need to change the workstation's fan speed. To do this, follow this procedure:

1. Turn on the workstation and press the **Tab** key until a select display message appears. Select the display frequency and resolution that are best for your workstation.
2. Stop the boot process by pressing any key before the ten-second limit. This gets you to the Boot Console Handler's (bch) **Main Menu**. You will only need to do this if you have autoboot turned on; otherwise, the system stops at the bch **Main Menu**. When the **Main Menu** prompt appears, type:

```
Main Menu: Enter command > configuration
```

3. Enter the following command at the **Configuration Menu** prompt:

```
Configuration Menu: Enter command > FanChoice RackMount
```

4. Return to the **Main Menu** and enter this command at the prompt to continue booting:

```
Main Menu: Enter command > boot
```

Desk-Side Fan Speed

If you currently have a rack-mount workstation that you want to convert to a desk-side workstation, you need to change the workstation's fan speed. To do this, follow this procedure:

1. Turn on the workstation and press the **Tab** key until a select display message appears. Select the display frequency and resolution that are best for your workstation.
2. Stop the boot process by pressing any key before the ten-second limit. This gets you to the Boot Console Handler's (bch) **Main Menu**. You will only need to do this if you have autoboot turned on; otherwise, the system stops at the bch **Main Menu**. When the **Main Menu** prompt appears, type:

```
Main Menu: Enter command > configuration
```

3. Enter the following command at the **Configuration Menu** prompt:

```
Configuration Menu: Enter command > FanChoice DeskSide
```

4. Return to the **Main Menu** and enter this command at the prompt to continue booting:

```
Main Menu: Enter command > boot
```

Initial System Loader (ISL) Environment

The ISL environment provides the means to load the operating system (HP-UX) environment. The ISL environment also provides an offline platform to execute optional diagnostic and utility programs from a boot device when HP-UX does not load.

The ISL program is the first program loaded into main memory from an external medium (LAN, disk, or tape) and launched by the initial program loader (IPL) routine from the Boot Administration environment.

The ISL environment provides the following capabilities:

- Execute user-entered commands to modify boot device paths and boot options in stable storage.
- Run offline diagnostic programs and utilities.
- Provide automatic booting of the HP-UX operating system after power-on or reset.

Invoking ISL from the Boot Console Handler

Perform the following steps to invoke ISL from the Boot Console Handler:

1. Follow the directions in the section “Accessing the Boot Console Handler” found in this chapter, and type the following at the prompt:

   ```
   Main Menu: Enter command > boot device [Enter]
   ```

   You are prompted:

   ```
   Interact with ISL (Y or N) > y [Enter]
   ```

2. Answering yes (y) causes the ISL to be loaded from the specified device. After a short time, the following prompt appears on the screen:

   ```
   ISL>
   ```

   ISL is the program that actually controls the loading of the operating system. By interacting with ISL, you can choose to load an alternate version of the HP-UX operating system.

   For example, if the usual kernel (`/stand/vmunix`) on the root disk has become corrupted, and you wish to boot the workstation from the backup kernel (`/stand/vmunix.prev`), type the following at the `ISL>` prompt:

   ```
   ISL> hpux /stand/vmunix.prev [Enter]
   ```

ISL User Commands

The following commands that are available in the ISL environment allow you to display and modify the boot characteristics of the system.

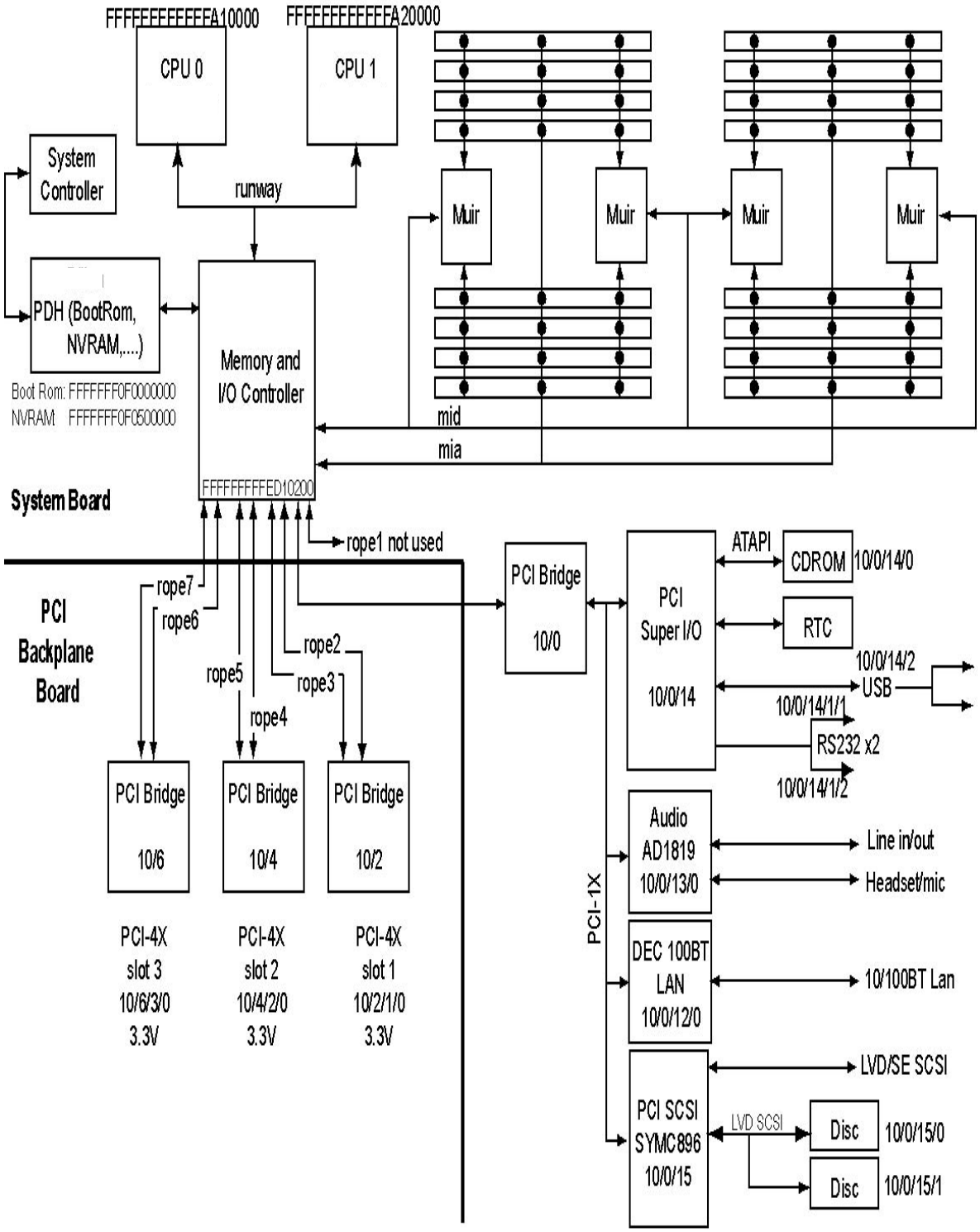
- `help` - lists ISL command menu and available utilities.
- `display` - displays the boot and console paths in Stable Storage and the current setting of the ISL Boot Flags.
- `primpath` - modifies the primary boot path entry in Stable Storage. The entry in Stable Storage for the primary boot device begins at byte address 0 and ends at 31.
- `altpath` - modifies the alternate boot path entry in Stable Storage. The entry for the alternate boot device begins at byte address 128 and ends at 159.
- `conspath` - modifies the console path entry in Stable Storage. The entry in Stable Storage for the console device begins at byte address 96 and ends at byte address 127. The entry for the keyboard and mouse devices begins at byte address 160 and ends at 191.
- `listautofl` or `lsautofl` - lists the contents of the (HP-UX) autoboot file.
- `support` - boots the Support Tape from the boot device.
- `readss` - displays 4 bytes (one word) from Stable Storage. The `readss` command requires a decimal number between 0 and 255 to address four bytes in Stable Storage.

6 Block Diagram

This chapter contains the block diagram for the J6700 workstation's system board and PCI board.

System Board and PCI Board

Figure 6-1. Block Diagram of the J6700's System Board and PCI Board



A Specifications

This appendix lists the environmental and electrical specifications for the HP VISUALIZE J6700 workstations.

Environmental Specifications

Altitude

Operating:	0–10,000 ft (0–3,000 m) @ 0 to +45˚ C
Non-operating:	15,000 ft (0–4,500 m) @ –40 to +70˚ C

DC Magnetic Field Interference

Operating:	<1 Gauss at surface of product
Non-operating:	<2 milli Gauss @ 7 feet

Electromagnetic Interference (EMI)

Emissions:	FCC Class A CISPR A

Electrostatic Discharge

Air discharge:	8kV
Contact discharge:	4kV

Temperature

Operating:	0 to +45˚ C
Non-operating:	–40 to +70˚ C

Humidity (Non-condensing)

Operating:	15 to 80%, 26˚ C max wet bulb for removable media
Non-operating:	0 to 90%

Leakage Current

Less than 3.5 mA

Shock

Operating:	20g at 3ms, 1/2 sine in normal axis with no hard errors
Non-operating:	80g at 3ms, 1/2 sine, normal axis

Vibration

Operating random:	0.21 Grms, 5–500 Hz
Swept sine survival:	0.5 g peak, 5–500 Hz
Random survival:	2.09 Grms, 5–500 Hz

Electrical Specifications

Input Power

	J6700
AC Frequency:	47–63 Hz
Maximum Power Input:	715 Watts
Maximum Current:	7.4–6.2 Amps AC at 100–120VAC 3.7–3.2 Amps AC at 200–230VAC

B SCSI Connections

This appendix provides information about connecting SCSI (Small Computer System Interface) devices to an HP VISUALIZE J6700 workstation.

Appendix Overview

This appendix contains the following main sections:

- SCSI Bus Differences
- SCSI Restrictions
- SCSI Bus Length Constraints
- Assigning SCSI Device IDs
- Connecting to the SCSI Ports

NOTE When attaching external SCSI devices, be sure to terminate the last device on each external SCSI bus. (Terminators are included in a small plastic bag shipped with the workstation.) If there are no external SCSI devices, the terminators must be installed directly on the connectors on the rear panel.

SCSI Bus Differences

A SCSI (Small Computer Systems Interface) bus is an IEEE standard bus for connecting a workstation to internal and external SCSI devices running at different speeds. There may be one device connected to the external SCSI port, or several SCSI devices may be daisy-chained together and connected to the external SCSI port. Examples of these SCSI devices are 4 mm DDS-format tape drives, CD ROM drives, and hard disk drives.

There are two types of SCSI buses available with the J6700 workstation: a Narrow Single-Ended SCSI-2 bus (SE), and an Ultra2 Wide Low Voltage Differential SCSI bus (LVD). The following table shows the specification differences between these two SCSI buses.

CAUTION Do *not* connect SE SCSI devices to the LVD SCSI connector, or vice versa, because damage may occur. Currently Hewlett-Packard does not support mixing SE and LVD devices on the same SCSI bus.

Table B-1. SCSI Bus Differences

SCSI Type	Transfer Rate	Data Bus Width	Maximum Addresses[1]	Maximum Cable Length	Device Physical Location[2]
SE/LVD	Up to 20 MB/sec	8 bits	0 through 6	3.0 meters (9.84 feet)	External
LVD	Up to 80 MB/sec	16 bits	0 through 6; 8 through 15	12 meters (39.37 feet)	Internal

1. Address 7 is reserved for host controller use on all buses.
2. This information is specific to the HP VISUALIZE J6700 workstations.

SCSI Restrictions

This section describes the SCSI restrictions that apply to the J6700 workstations in the following areas:

- Cables
- Terminators
- SCSI configuration constraints

NOTE The SE SCSI bus supports only 7 devices because address 7 is reserved by the system. Similarly, the LVD SCSI bus supports only 15 devices because address 7 is reserved by the system.

Cables

Only SCSI cables approved by HP can be used to connect a J6700 workstation to SCSI devices. HP offers the following SCSI cables for SE SCSI devices:

- 1.0 meter (3.281 feet) cable (HP Product Number C2908A)
- 1.5 meter (4.922 feet) cable (HP Product Number C2956A)

HP offers the following SCSI cables for LVD SCSI devices:

- 0.5 meter (1.64 feet) cable (HP Product Number C2978A)
- 1.5 meter (4.922 feet) cable (HP Product Number C2979A)

CAUTION SCSI cables approved by HP are designed to function within the SCSI tolerances for HP devices. Use of other cables can result in significant problems with system operation.

Always use the shortest possible cable(s) for a configuration.

NOTE See “SCSI Bus Length Constraints” on page 146 to determine the total length of SCSI cables.

Terminators

The J6700 workstation has auto termination and does not require external termination.

NOTE The last external device connected to the SCSI bus must be terminated with a SCSI terminator.

SCSI Configuration Constraints

The number of SCSI devices per bus is limited (see Table C-1 earlier in this appendix). Before adding another SCSI device, determine if the system can support the additional device.

SCSI Bus Length Constraints

This section discusses SCSI bus lengths constraints for the SE and LVD SCSI buses.

SE SCSI Bus Length

The maximum cable length for an SE SCSI bus is 3 meters. The J6700 workstation use a negligible amount of this maximum cable length.

NOTE When calculating the total SE SCSI cable/bus/trace length used externally, remember to account for cables connecting external devices together as well as the bus length internal to those devices.

There are two total cable length specifications you need to consider when dealing with an SE SCSI bus on a workstation. Note that these specifications are based on the requirement that the SCSI device being connected to the SE SCSI bus does not exceed the maximum capacitance of 25 picofarads (pF). Please check with the vendor of the SCSI device if you are not sure of the device's maximum capacitance.

The total cable length specifications are as follows:

- For a total of one to four devices being connected to the SE SCSI bus, the total length of cable used should not exceed 3.0 meters.
- For a total of five to eight devices being connected to the SE SCSI bus, the total length of cable used should not exceed 1.5 meters.

NOTE The computer is counted as one of the devices, and the internal length of its cabling is 0.15 meters. This length needs to be considered in determining the total cable length.

LVD SCSI Bus Length

The maximum cable length for an LVD SCSI bus is 12 meters. The J6700 workstation use 1 meter of this maximum cable length internally. This means that up to 11 meters of cable can be used for connecting external LVD SCSI devices to this workstation.

NOTE When calculating the total LVD SCSI cable/bus/trace length used externally, remember to account for cables connecting external devices together as well as the bus length internal to those devices.

Assigning SCSI Device IDs

Before assigning a SCSI device ID to a new SCSI device, you need to determine which SCSI device IDs are available. To view the SCSI IDs already in use, type the following command at the prompt and press [Enter]:

```
/usr/sbin/ioscan -f
```

After a few moments, the ioscan utility lists all of the I/O devices it could find. The list appears similar to the following:

```
Class       I  H/W Path       Driver    S/W State   H/W Type     Description
============================================================================
bc          0                  root      CLAIMED     BUS_NEXUS
bc          1  10              ccio2     CLAIMED     BUS_NEXUS    I/O Adapter
ba          0  10/0       ROPEtoPCI     CLAIMED     BUS_NEXUS    PCI Bus Bridge - ROPEtoPCI
graphics    0  10/0/1/0        graph3    CLAIMED     INTERFACE    PCI(103c1005)
lan         0  10/0/12/0       btlan3    CLAIMED     INTERFACE    PCI(10110019)
audio       0  10/0/13/0       audio     CLAIMED     INTERFACE    Built-in Audio
ext_bus     0  10/0/14/0       side      CLAIMED     INTERFACE    PCI(100b0002)
target      0  10/0/14/0.0     tgt       CLAIMED     DEVICE
disk        0  10/0/14/0.0.0   sdisk     CLAIMED     DEVICE       HITACHI CDR-8435 CDROM
target      0  10/0/14/0.7     tgt       CLAIMED     DEVICE
ctl         0  10/0/14/0.7.0   sctl      CLAIMED     DEVICE       Initiator
ba          1  10/0/14/1       superio   CLAIMED     BUS_NEXUS    PCI Core I/O Adapter
tty         0  10/0/14/1/1     asio0     CLAIMED     INTERFACE    Built-in RS-232C
tty         1  10/0/14/1/2     asio0     CLAIMED     INTERFACE    Built-in RS-232C
ext_bus     1  10/0/14/1/3     SCentIf   CLAIMED     INTERFACE    Built-in Parallel Interface
pc          0  10/0/14/1/4     siofdc    CLAIMED     INTERFACE    Built-in Floppy Drive
floppy      0  10/0/14/1/4.1   sioflop   CLAIMED     DEVICE       HP_PC_FDC_FLOPPY
usb         0  10/0/14/2       hcd       CLAIMED     INTERFACE    Built-in USB Interface
usbhub      0  10/0/14/2.1     hub       CLAIMED     DEVICE       USB Root Hub
ext_bus     2  10/0/15/0       c720      CLAIMED     INTERFACE    Ultra2 Wide SCSI Dual Port
target      1  10/0/15/0.7     tgt       CLAIMED     DEVICE
ctl         1  10/0/15/0.7.0   sctl      CLAIMED     DEVICE       Initiator
ext_bus     3  10/0/15/1       c720      CLAIMED     INTERFACE    Ultra2 Wide SCSI Dual Port
target      2  10/0/15/1.6     tgt       CLAIMED     DEVICE
disk        0  10/0/15/1.6.0   sdisk     CLAIMED     DEVICE       SEAGATE ST39102LC
target      3  10/0/15/1.7     tgt       CLAIMED     DEVICE
ctl         2  10/0/15/1.7.0   sctl      CLAIMED     DEVICE       Initiator
ba          2  10/1            ROPEtoPCI CLAIMED     BUS_NEXUS    PCI Bus Bridge - ROPEtoPCI
ba          3  10/2            ROPEtoPCI CLAIMED     BUS_NEXUS    PCI Bus Bridge - ROPEtoPCI
ba          4  10/4            ROPEtoPCI CLAIMED     BUS_NEXUS    PCI Bus Bridge - ROPEtoPCI
ba          5  10/6            ROPEtoPCI CLAIMED     BUS_NEXUS    PCI Bus Bridge - ROPEtoPCI
processor   0  32              processor CLAIMED     PROCESSOR    Processor
processor   1  34              processor CLAIMED     PROCESSOR    Processor
```

Assigning External SCSI Device IDs

You can determine which SCSI devices are currently in use by looking under the `H/W Path` heading in the output from the `ioscan` command. The entry `10/0/15/0` is the built-in SCSI bus. For devices connected to the built-in SCSI bus, such as disks, the number between the two decimals and after the third "/" in the hardware path specifies the SCSI ID for that device. For example, a hardware path of `10/0/15/0.2.0` specifies an SCSI device at SCSI ID 2. Here is the breakdown of the hardware path:

SCSI device. `10/0/15/0.2.0`

SCSI. `10/0/15/0.2.0`

SCSI ID 2. `10/0/15/0.2.0`

CAUTION Do not use SCSI device ID 7 for any device. It is reserved for the built-in SCSI bus controller.

Assigning Internal SCSI Device IDs

You can determine which LVD SCSI devices are currently in use by looking under the `H/W Path` heading in the output from the `ioscan` command discussed previously. The entry `10/0/15/1` is the built-in LVD SCSI bus. For devices connected to the built-in LVD SCSI bus, such as disks, the number between the two decimals and after the third "/" in the hardware path specifies the SCSI ID for that device. For example, a hardware path of `10/0/15/1.5.0` specifies a LVD SCSI device at SCSI ID 5. Here is the breakdown of the hardware path:

SCSI device. `10/0/15/1.5.0`

LVD SCSI. `10/0/15/1.5.0`

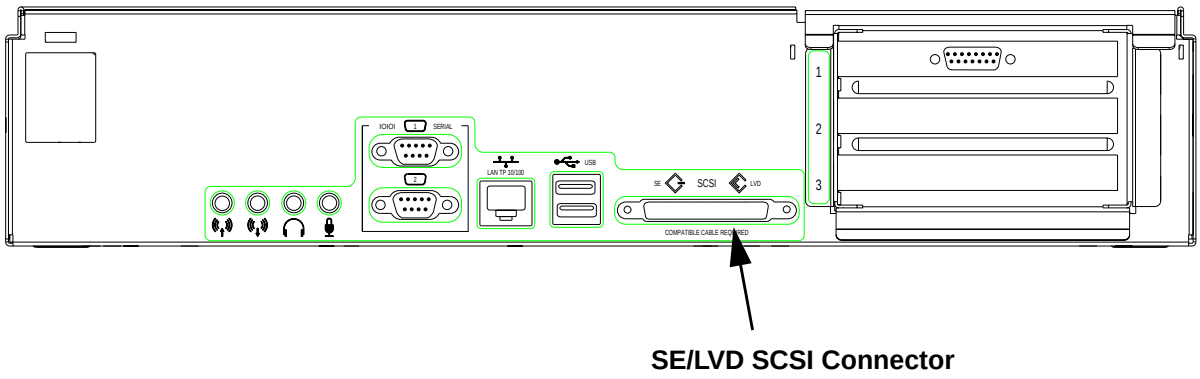
SCSI ID 5. `10/0/15/1.5.0`

CAUTION Do not use SCSI device ID 7 for any device. It is reserved for the built-in SCSI bus controller.

How To Connect An SE SCSI Device

This section describes how to connect to the workstation's SE SCSI port.

Figure B-1. SCSI Port Connections



NOTE The last external device connected to the SCSI bus must be terminated with a SCSI terminator.

C Related Documentation

This appendix lists the part numbers and titles of documents related to the HP VISUALIZE J6700 workstations.

Additional Documentation

Site Preparation Guide

- A5990-90005 – *Site Preparation Guide HP VISUALIZE J6000 Workstations and Multiple System Configurations*

Installation Poster and Getting Started Guide

- A5990-90000 - *QuikInstall Poster HP VISUALIZE J6000 Workstation*
- A5990-90022 - *Getting Started Guide HP VISUALIZE J6700 Workstation*

Parts and Replacement Guide and Technical Reference

- No part number - *Technical Reference HP VISUALIZE J6700 Workstation*
- A5990-90060 - *Parts and Replacement Guide HP VISUALIZE J6000 Workstation*